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3112 and 3116 Page Printer: Service Manual

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This printer has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult your point of purchase or service representative for additional suggestions.

The manufacturer is not responsible for any radio or television interference caused by using other than recommended cables or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

Note: To comply with FCC regulations on electromagnetic interference, for a Class B computing device, the printer cable must be shielded.

To assure compliance with FCC regulations for a Class B computing device, use a properly shielded and grounded IBM cable. Part numbers for the various interface cables are: part number 1525612 for parallel interface, and part number 8509386 for serial interface. Use of a substitute cable not properly shielded and grounded may result in violation of FCC regulations.

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This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled: "Digital Apparatus", ICES-003 of Industry Canada.

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The United Kingdom Telecommunications Act 1984

This apparatus is approved under the approval number NS/G/1234/J/100003 for the indirect connections to the public telecommunications systems in the United Kingdom.

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Class I laser products are not considered to be hazardous. The printer contains internally a Class IIIb (3b) laser that is nominally a 5 milliwatt gallium arsenide laser operating in the wavelength region of 770-795 nanometers. The laser system and printer are designed so there is never any human access to laser radiation above a Class I level during normal operation, user maintenance, or prescribed service condition.

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- Les normes de sécurité de certaines pièces n'étant pas toujours explicites, les pièces de rechange doivent être identiques ou conformes aux caractéristiques des pièces d'origine.

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- Durante lo smontaggio e il manutenzionamento di questo prodotto, è possibile il rischio accresciuto di scosse elettriche e

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Ozone Information

This product does not produce measurable amounts of ozone gas.

Preface

This manual is divided into the following chapters:

- “General Information” contains a general description of the printer and the maintenance approach used to repair it. Special tools and test equipment are listed in this chapter, as well as general environmental and safety instructions.
- “Diagnostic Information” contains error code table, symptom table, and service checks used to isolate failing field replaceable units (FRUs).
- “Diagnostic Aids” contains tests and checks used to locate or repeat symptoms of printer problems.
- “Repair Information” provides instructions for making printer adjustments and removing and installing FRUs.
- “Connector Locations” uses illustrations to identify the major components and test points on the printer.
- “Preventive Maintenance” contains safety inspection guidelines, lubrication specifications, and maintenance information to prevent problems and maintain optimum performance.
- “Parts Catalog” contains illustrations and part numbers for individual FRUs.

Table of Contents

General Information

The 3112 and 3116 are designed to attach to IBM**-compatible PC's and to most types of computer networks including a twinax or coax system. All models come standard with PostScript** Level 2 emulation and PCL** 5 emulation, and SCS capability (IPDS is optional). The following briefly describes the differences between the models:

	3112-001	**3116-001**	**3116-002**
Maximum print speed (pages/min.)	12	16	16
Paper input capacity (pages/ min.)	200	200	500
Paper output capacity (pages)	250	250	500
Output bin full sensing	No	No	Yes
Standard Memory (MB)	2	4	4

There is also a 3116-003 model which is a 3116-002 model configured standard with a second paper drawer, an Ethernet card, and 8MB of memory. From a service standpoint it is identical to the 3116-002.

Power Consumption

	3112	3116
Power Saver Mode	21W	20W
Printing (average)	260W	310W
Max. A/C draw 110V	6.8A	9.8A
Max. A/C draw 220V	3.4A	5.0A

Options

The following options are available. Some options are not available in every country. Contact your point of purchase for options available in your country.

Memory upgrade options of 2MB, 4MB, 8MB, 16MB and 32MB.

Flash memory options of 2MB and 4MB

Integrated network options

- Token-Ring option
- Ethernet option
- AppleTalk** option

200 and 500-sheet paper trays of A5, letter, and legal size.

500-sheet second drawer (with letter-size paper tray)

Envelope+ feeder

100-sheet auxiliary feeder

Duplex option

Font cards (bitmapped or scalable fonts)

40MB Hard Disk

Maintenance Approach

The diagnostic information in this manual will lead you to the correct field replaceable unit (FRU) or part. Use the error code charts, symptom index, service checks, and diagnostic aids to determine the symptom and repair the failure. Begin with “Start” on page 2-2.

This printer can be serviced without being connected to a host.

After you complete the repair, perform tests as needed to verify the repair.

Tools Required For Service

Flat-blade screwdriver

#1 Phillips screwdriver

#2 Phillips screwdriver

5.5 mm nut driver

8 mm wrench

Needlenose pliers

Diagonal pliers

Spring hook

Feeler gauges

Analog or digital multimeter

Parallel wrap plug 1319128

Serial wrap plug 1329048

Abbreviations

ASIC	Application-Specific Integrated Circuit
CSU	Customer Setup
DRAM	Dynamic Random Access Memory
EEPROM	Electrically Erasable Programmable Read-Only Memory
EP	Electrophotographic Process
ESD	Electrostatic Discharge
FRU	Field Replaceable Unit
HVPS	High Voltage Power Supply
INA	Integrated Network Access
LAN	Local Area Network
LASER	Light Amplification by Stimulated Emission of Radiation
LCD	Liquid Crystal Display
LED	Light-Emitting Diode
LVPS	Low Voltage Power Supply
NVRAM	Nonvolatile Random Access Memory
OEM	Original Equipment Manufacturer
PICS	Problem Isolation Charts
PIXEL	Picture Element
POR	Power-On Reset
POST	Power-On Self Test
PQET	Print Quality Enhancement Technology
RIP	Raster Image Processor
ROM	Read-Only Memory
ROS	Read-Only Storage
SIMM	Single In-line Memory Module
SRAM	Static Random Access Memory
UPR	Used Parts Replacement
VAC	Volts alternating current
VDC	Volts direct current

Diagnostic Information

Two-digit codes are messages for the user, but if they recur frequently or at inappropriate times they may be symptomatic of a service problem.

Refer to the diagnostics Error log for the last six machine errors.

Error Code	Explanation
20 Paper Jam	The input sensor was not unmade in time.
21 Paper Jam	The exit sensor was not made in time after the input sensor was made.
22 Paper Jam	The exit sensor was not unmade in time.
23 Paper Jam	Jam at the duplex unit. Paper is either not leaving the duplex entry sensor in time or not making or unmaking the duplex exit sensor in time. *See* “Duplex” on page 17.
24 Short Paper	The defined paper size is too short to print data as formatted.
25 Incorrect Manual Feed	Paper fed manually while motors running and previous page in path.
26 Duplex Tray Missing	Duplex unit is installed but paper tray is not sensed.
27 Change Envelope/Paper	Envelopes/paper loaded are wrong size.
28 Load Envelope/Paper	Input sensor not made after pick attempt. Tray is empty or printer is requesting a manual feed.
29 Output Bin Full	The output bin sensor has not been unmade. *See* “Output Bin Sensor” on page 26.
30 Top Cover Open or Print Cartridge Missing	Make sure the spring-mounted pin on the printhead shroud is installed properly and that it is detected by the ramp on the print cartridge as the cover closes. The pin should enter the tower on the HVPS and depress the cover switch.
32 Wrong Print Cartridge installed	The installed print cartridge is not supported.

Error Code	Explanation
38 Memory Full	Memory used to store pages is full. To verify that the printer recognizes all the installed memory, go to the user menus and print the “Print Menus” test page. Make sure the memory shown on the printout matches the installed memory.
39 Complex Page	Page too complex to print.To verify that the printer recognizes all the installed memory, go to the user menus and print the “Print Menus” test page. Make sure the memory shown on the printout matches the installed memory.
43 Font Card Not Supported	Font card format not supported by printer.
44 Defective Font Card	Defective font card installed in font slot.
47 Font Card Removed While Printing	Printer needs data on removed card.
51 Defective Flash	The printer detects a defective Flash SIMM. If the error recurs replace the Flash SIMM.
52 Flash Full	Not enough flash memory for data requested to be stored.
53 Unformatted Flash	Flash problem at POR or while attempting to write.
54 Serial Error	Framing or parity error on serial.
57 Check Duplex Connection	The duplex unit has been electrically disconnected from the printer but the printer top cover is not open. Check the auto-connect plugs on the duplex unit and the printer.
58 Duplex Not Attached	Duplex is no longer connected, and printer top cover is closed.
59 Duplex Cover Open	Top cover of duplex unit is sensed open.
62 Disk Full	Not enough disk space for data that has been requested to be written to disk.
63 Unformatted Disk	Format the disk.

Error Code	Explanation
64 Defective Disk	The printer will ignore a disk it senses as defective. Run the Quick Disk Test. If the test fails, the disk is defective or the data on track 1 is bad. If the Quick Disk Test passes but the disk does not work, run the Disk Test/Clean (2 hour test). Replace the disk if instructed by the operator panel.
7X Network Card Codes For example, 71:X	These user codes are documented in the *Network Printer Utility Guide* (SA40-0822). *See* “Network Wrap Tests” on page 25. Note: 7X codes are normal when an INA is installed but no LAN cable is attached. Press “Disable” to continue.
80 Scheduled Maintenance	Printer has reached 200,000 prints without maintenance count reset.
88 Toner Low	Toner sensor detects low toner.
90X Software Error	Unrecoverable software error. If one of these errors appeared during POST, or while the printer was idle (not printing or receiving data), or while trying to print one of the internal test pages, replace the RIP Board. If the error appeared while sending a job from the host to the printer, turn the printer off, then turn it on and try again. If the error appears again, call the next level service support for assistance.
917 Transfer Roll Error	Cannot start servo operation. Verify correct cable connections from the engine board to the HVPS. Make sure there is continuity between the transfer roller and its contact on the HVPS; replace the transfer roll if the continuity is correct. If there is no continuity, make sure the HVPS contact returns to its upward limit when depressed, and make sure the left bearing of the transfer roll is making proper contact.

Error Code	Explanation
918 Transfer Roll Error	Servo Failure. Verify correct cable connections from the Engine board to the HVPS. Make sure there is continuity between the transfer roller and its contact on the HVPS; replace the transfer roll if the continuity is correct. If there is no continuity, make sure the HVPS contact returns to its upward limit when depressed, and make sure the left bearing of the transfer roll is making proper contact.
920 Fuser Error	Fuser is below temperature while printing. *See* “Fuser: 920, 921, or 922 Error” on page 20.
921 Fuser Error	Fuser is below standby temperature when idle. *See* “Fuser: 920, 921, or 922 Error” on page 20.
922 Fuser Error	Fuser failed to reach standby temperature. *See* “Fuser: 920, 921, or 922 Error” on page 20.
923 Fuser Error	Fuser is too hot while printing or when idle. *See* “Fuser: 923 or 924 Error” on page 21.
924 Fuser Error	Open detected in thermistor circuit. *See* “Fuser: 923 or 924 Error” on page 21.
927 Fan Stalled	*See* “Fan (927 Error)” on page 19.
928 Erase Lamps	Erase lamp assembly missing or disconnected.
931 Printhead Error	No first hsync. *See* “Printhead” on page 29.
932 Printhead Error	Lost hsync. *See* “Printhead” on page 29.
934 Printhead Error	Lost lock condition. *See* “Printhead” on page 29.
935 Printhead Error	Mirror motor unable to reach operating speed. *See* “Printhead” on page 29.
941 ROM SIMM	ROM SIMM failed CRC; code data or font data. Run the diagnostic Memory Test for ROM. Replace the SIMM if the test fails or the problem recurs after POR; replace the RIP Board if the SIMM does not fix the problem.

Error Code	Explanation
944 RIP Board	RIP processor failure. Replace the RIP Board.
945 RIP Board	ASIC 1 failure. Replace the RIP Board.
946 RIP Board	ASIC 2 failure. Replace the RIP Board.
947 Engine Board	Engine ASIC RAM failure. Replace the engine board.
948 Engine Board	Engine ASIC electronics failure. Replace the engine board.
950 RIP Board	SRAM failure. Replace the RIP Board.
951 Engine Board	PQET SRAM failed verification test. Replace the engine board.
952 Engine Board	Unable to zero PQET SRAM. Replace the engine board.
953 Engine Board	NVRAM failure. Replace the engine board.
954 Engine Board	Printhead crystal not functioning correctly. Replace the engine board.
960 Memory Error	Bad or missing DRAM in the base DRAM slot. Reseat the DRAM and run the diagnostic Memory Test for DRAM. POR the printer. If the test fails or the problem recurs, replace the DRAM SIMM.
961 Memory Error	Bad DRAM in the optional DRAM slot. Reseat the DRAM and run the diagnostic Memory Test for DRAM. POR the printer. If the test fails or the problem recurs, replace the DRAM SIMM.
970 Network Card 1	Network card 1 processor failure. Go to “Host Printing Problems” on page 22.
970 Network Card 2	Network card 2 processor failure. Replace network card 2.
971 Network Card 1	Go to “Host Printing Problems” on page 22.
971 Network Card 2	Network card 2 RAM failure. Replace network card 2.
972 Network Card 1	Go to “Host Printing Problems” on page 22.

Error Code	Explanation
972 Network Card 2	Network card 2 ROS/FLASH failure. Replace network card 2.
973 Network Card 1	Go to “Host Printing Problems” on page 22.
973 Network Card 2	Network card 2 EEPROM/NVRAM failure. Replace network card 2.
974 Network Card 1	Go to “Host Printing Problems” on page 22.
974 Network Card 2	Network card 2/Network interface error. Replace network card 2.
976 Network Card 1	Host card 1 software error. Verify that the network card is installed and grounded correctly. If this error returns after a POR, there is a software or microcode incompatibility problem. Do not replace the card. Contact your next level of support.
976 Network Card 2	Network card 2 software error. Verify that the network card is installed and grounded correctly. If this error returns after a POR, there is a software or microcode incompatibility problem. Do not replace the card. Contact your next level of support.
977 Network Card 1	Host card 1 is installed but is not communicating with the RIP Board. *See* “Network Card 977 Errors” on page 25.
977 Network Card 2	Network card 2 is installed but is not communicating with the RIP Board. *See* “Network Card 977 Errors” on page 25.
978 Network Card 1	General host 1 card hardware error. Go to “Host Printing Problems” on page 22.
978 Network Card 2	General network 2 card hardware error. Replace network card 2.
979 Network Card 1	General host 1 card software error. Verify that the network card is installed and grounded correctly. If this error returns after a POR, there is a software or microcode incompatibility problem. Do Not replace the card. Contact your next level of support.

Error Code	Explanation
979 Network Card 2	General network 2 card software error. Verify that the network card is installed and grounded correctly. If this error returns after a POR, there is a software or microcode incompatibility problem. Do Not replace the card. Contact your next level of support.
990 Duplex Option	Duplex error. *See* “Duplex” on page 17.
991 Duplex System Card Failure	Duplex system board failure. Replace the duplex system board.
993 Duplex Comm. Failure	Communications between the duplex unit and the printer have failed. *See* “Duplex” on page 17.

Power-On Self Test (POST)

When you turn the printer on, it performs a Power-On Self Test. Check for correct POST functioning by observing the following:

1. 1 1/2 rows of pels appear on the display and then clear.
2. Diamonds fill the display and then clear.
3. The fuser lamp and the fan turn on. [Performing Self Test] appears on the display.

   Note: The printer may be idle for up to 60 seconds as the fuser warms to operating temperature. Printer idle time is shorter if the fuser is already warm.

   Note: If the duplexer is installed, the duplex drive motor turns on for about 5 seconds just before the Ready screen appears.
4. The ready screen appears on the display.

   Note: Diagnostics menu appears if you are in diagnostic mode.
5. The drive motor and the mirror motor start to run. The fan starts to run at high speed.
6. The drive motor runs for approximately 10 seconds. The fan runs at high speed, then switches to low speed.

If the printer completes all these steps and no error messages are displayed, the printer has successfully completed the POST.

Symptom Table

Symptom	Action or Service Check
Dead Machine	Dead Machine Service Check
Machine Hangs Displaying Diamonds	Machine Hangs Displaying Diamonds Service Check
Repeats a pattern of 5 beeps and a pause.	Operator Panel Service Check
Operator Panel	Operator Panel Service Check
Paper Feed, Base Printer	Paper Feed, Base Printer Service Check
Paper Feed, Duplex Unit	Paper Feed, Duplex Unit Service Check
Paper Feed Problem, 500-Sheet Second Tray	Paper Feed Problem, 500-Sheet Second Tray Service Check
Paper Feed Problem, Envelope+ Feeder/100-Sheet Auxiliary Feeder	Paper Feed Problem, Envelope+ Feeder/ 100-Sheet Auxiliary Feeder Service Check
Automatic Paper Size Sensing Problem	Automatic Paper Size Sensing Problem Service Check
Host Printing Problems	Go to “Host Printing Problems” on page 22.
LAN Problems	Go to “LAN Problems” on page 24.
Blank Page	Blank Page Service Check
Black Page	Black Page Service Check
Random Marks	Random Marks Service Check
Regularly Spaced Marks	Regularly Spaced Marks Service Check
Skew, all edges	Skew Service Check
Skew, top and bottom only	Skew, top and bottom Service Check
Light Print	Light Print Service Check
Blurred or Fuzzy Print	Blurred Fuzzy Print Service Check
Residual Image	Residual Service Check
Honeycomb	Honeycomb Service Check
Background	Background Service Check

Symptom	Action or Service Check
Horizontal Void or Streak	Horizontal Service Check
Vertical Void or Streak	Vertical Service Check
Banding	Banding Service Check

Banding

Banding appears as light and dark horizontal lines on a page that is supposed to be uniformly gray. It is due to variation in the speed of the paper as it moves from roll to roll during development or transfer. It is undetectable when printing text and is most noticeable on fine dot or horizontal line patterns such as the second page of Print Test 2 or Print Test 3. Inspect the gear train and the paper feed rollers for wear, damage, dirt, or binds.

Background

Areas that are supposed to stay blank are getting small amounts of toner deposited on them. Clean the erase lamps and the printhead window.

Verify that all the erase lamps are working by powering on or off with the top cover open. Verify that there is +24VDC on engine board J9-1 and between +15 and +20VDC on engine board J9-2. Shorting engine board J9-2 to ground should turn on all the erase lamps. Check the erase lamp cable continuity. Replace the transfer roll housing if the voltage and the cable are good.

Inspect the contacts on the HVPS; make sure each spring-loaded contact returns when pressed and released.

Rough Paper mode can cause background on some papers; if Rough Paper mode is on, turn it off and run the print test again.

Printing on coated paper or using refilled print cartridges can also cause background.

Run the Print Test with the RIP Board removed and check the following

voltages; then stop the test and check the voltages again:

Connector	Voltage while Printing	Voltage while Idling
J13-1	Less than 5VDC	0VDC
J13-2	Less than 5VDC	0VDC
J13-3	(Fluctuates between pages) +1.5VDC	0VDC
J13-8	Less than 1VDC	+6VDC

If any voltages are not correct replace the engine board.

If no problem is found, enter the diagnostics mode and change the Charge Roll setting.

Users who run large jobs with very dense graphics in high humidity environments may get some print quality improvement from increasing the Transfer setting; users with more normal jobs will see no difference.

Make sure the HVPS contacts to the transfer roll housing are in good condition.

Black Page

Black output is usually caused by an incorrect high voltage in the printing process, resulting in toner development on the entire photoconductor drum. Check the condition of each HVPS contact and make sure they spring back when pressed. Check the continuity of the HVPS cable. Make sure the following voltages are correct; if they are not, replace the engine board.

Connector	Voltage
J13-5 to J13-4	+24VDC
J13-6 to J13-4	+24VDC

Run the Print Test with the RIP Board removed. Make the following voltage checks while printing and again while idling. If the voltages are not

correct, replace the engine board.

Connector	Voltage while Printing	Voltage while Idling
J13-1 to J13-4	+4.5VDC	0VDC
J13-2 to J13-4	+4VDC	0VDC

If no other trouble is found replace the HVPS.

Blank Page

Inspect the printhead shutter for proper operation and make sure the actuator on top of the cartridge is present and extends into the printhead shroud when the printer top cover is closed. A failed printhead will cause a 931 Service error rather than blank output.

Check the continuity of the HVPS cable. The HVPS and transfer roll contacts should be clean and spring back when pressed. Make sure the transfer roll contact under the left bearing is making contact with the HVPS.

Run the Print Test with the RIP Board removed. Make the following voltage checks:

Connector	Voltage while Printing	Voltage while Idling
J13-1 to J13-4	Less than 5VDC	0VDC
J13-2 to J13-4	Less than 5VDC	0VDC
J13-3 to J13-4	(Fluctuates between pages) +1.5VDC	0VDC
J13-8 to J13-4	Less than 1VDC	+6VDC

If the voltages are not correct replace the engine board.

Blurred or Fuzzy Print

This can be caused by a damaged gear train or by paper slippage in the

feed roll or transfer roll. Also see Banding.

Inspect the HVPS contacts; make sure each spring-loaded contact returns when pressed and released. Inspect the transfer roll housing contacts for damage or contamination. Check the gear train for damage, binds, or wear.

When using the 100-sheet auxiliary feeder, some blurring may occur at the point where the feeder's friction rollers release the paper.

Dead Machine

Possible causes: no voltage reaching the printer, LVPS failure, blown LVPS fuse, failure of the On/Off switch or switch linkage, or a shorted electrical component.

Check for the indicated voltages at the LVPS connection to the engine board. If no voltages are present, remove the LVPS cover and check fuse F1 and the power switch before replacing the LVPS.

If some voltages are present but all are not correct, disconnect all cables except the LVPS from the engine board. POR and verify that the LVPS voltages are correct. Turn the power back off and, one at a time, reconnect the engine board cables, powering on in between each connection and checking the voltages. The connection which causes the voltages to be wrong indicates which component is bad. Repair or replace the failing component or cable as necessary.

Duplex

The duplexer should home — the front shafts should turn and the input deflector should move — immediately when you install the duplexer with the printer already powered on, or just before the [Ready] screen is displayed when you POR the printer with the duplexer installed. This means the duplexer and the printer are communicating and thus the printer engine board, duplexer system board, and the cables between them are all good.

> **Note:** With twinax and coax printing, the printout is always simplex unless the job specifies duplex. (There is no network-duplex menu item like the 391x had.)

If the duplexer does not home immediately but homes after 5 or 6 seconds, the duplexer is receiving +34VDC from the printer but is not communicating with the printer. The duplexer homes on its own as a signal that it is functional.

If the duplexer does not home at all, it is either damaged or is not receiving +34VDC from the printer.

To check the connection from the printer engine board to the duplex system board, remove the printer RIP Board. Remove the duplex top cover and table cover, and reinstall the duplexer. Engine board J3-2 should have continuity with the duplex system board J5-1, J3-3 with J5-2, and so on. With power on, you should have the following voltages:

Connector		**Voltage to Ground**
Engine Board	J3-3	+34VDC
	J3-5	+5VDC
	J3-7	+5VDC
Duplex System Board	J5-2	+34VDC
	J5-4	+5VDC
	J5-6	+5VDC

If you do not find a cable or voltage problem replace the duplex system board. If this does not fix the problem, replace the printer engine board.

A **933 error** indicates that communication between the printer and duplexer had been established but has been lost. Check the cable as above; if the error persists replace the duplex system board.

23 Paper Jams: Examine the paper path in the duplex unit and in the fuser exit area for paper or other obstructions. Make sure the duplex unit is positioned correctly on the printer, and that the gear at the bottom of the duplex unit meshes with the gear on the top of the paper tray. Check that the paper is fed with no skew or binds from the duplexer into the metal channel at the right edge of the tray cover. The tray roller should move the paper forward when the tray gear is turned, but allow the paper to be pulled by the D-roll when it picks. Make sure the belt to the duplex DC motor is in place. Make sure the duplex table cover (floor) is correctly snapped in place at its front and rear and that the gear block assembly is correctly snapped into the bottom cover. Run duplex diagnostics tests #1 and #2 to make sure there is no slippage in

the paper path. Make sure the flags of the duplex unit input and exit sensors move freely.

While the **23** is displayed, press and hold the Return button while pressing the second button from the top, and note the 7th and 8th digits from the left. If they are 01 or 03, there is a problem with the duplex input sensor signal. Remove the duplex top cover and table cover and reinstall the duplexer on the printer. Measure the voltage on J5-12 of the duplex system board; it should fluctuate from 0 to +5VDC as you toggle the sensor. Check the sensor cable continuity. If the sensor and the cable are good, replace the duplex system board.

If the 7th and 8th digits are 04, there is an exit sensor problem. Remove the duplex top cover and table cover and reinstall the duplexer on the printer. Remove the paper tray so you can reach the sensor. Measure the voltage on J5-8 of the duplex board; it should fluctuate from 0 to +5VDC as you toggle the sensor. Check the sensor cable continuity. If the sensor and the cable are good, replace the duplex system board.

Fan (927 Error)

The fan should run continuously when the printer is powered up, unless the printer is in Power Saver mode. Check that the fan rotates freely when spun manually and that the cable connections to the fan are OK. The voltage at engine board J2-7 should be approximately +24VDC when the top cover is up. Short J2-7 to ground (J2-6) to test the fan; if the fan does not run check the continuity of the fan cable before replacing the fan. A bad fan can pull down the +24V line even if it runs; check that J2-8 has between +21 and +26VDC when the fan is running; if it does not, replace the engine board.

Fuser Theory

The fuser lamp operates off line voltage from the LVPS. The thermistor is in contact with the fuser hot roll. The system board reads the thermistor resistance and toggles a TRIAC in the LVPS which cycles the lamp on and off to maintain the proper hot roll temperature. Inside the fuser shroud there is a thermal fuse which is in series with the lamp; if the TRIAC fails and leaves the lamp on continuously, the fuse melts and shuts off power to the lamp.

The thermistor output voltage is proportional to the fuser temperature and is on engine board J8-4. The voltage will cycle from approximately 2.0 to 2.3VDC as the lamp goes on and off during idle, and will be around 2.7VDC during continuous printing when the Fuser Temperature is set to Normal. In Power Saver mode the lamp is left off until a job is printed.

The engine board signal to the LVPS TRIAC is on J4-16. The voltage is 0VDC when the lamp is to be on and +5VDC when the lamp is to be off. The lamp can be tested by briefly connecting this pin to ground.

Fuser: 920, 921, or 922 Error

A 922 error during a POR caused by low line voltage can usually be cleared by doing another POR.

If the fuser lamp is lighting very dimly, check for a 220V lamp installed in a 110V machine.

Check all the connectors to the exit sensor card and the lamp power connections at the left end of the fuser. Make sure the thermistor is making contact with the hot roll. Check the continuity of the lamp, the thermal fuse, and the fuser power cable. Check the thermistor resistance at engine board J8-3 to J8-4; it should be from 100K Ohms to 260K Ohms when cold; it may be as low as 2.3K Ohms when hot but increases quickly as the fuser cools. There should be no connection from either pin to ground.

If the thermal fuse has blown, the fuser and the fuser wiper will be damaged. Before replacing the fuser and the fuser wiper, check the voltage at engine board J4-16 as you POR again. It should stay at 0 until the 922 Error is displayed and then go to +5VDC; if it does not, replace the

engine board, the fuser, and the fuser wiper. Next, measure the voltage to the fuser lamp during a POR; it should be line voltage until the 922 Error is displayed, if it does not, replace the LVPS, the fuser, and the fuser wiper.

If the voltage to the fuser lamp is the not the same as the line voltage, replace the LVPS.

If the lamp, fuser power cable, thermal fuse, thermistor and lamp voltage are OK, check J4-16 to see if the engine board is sending the correct signal to the TRIAC. At POR this signal should go to +5VDC and then immediately drop to 0VDC until the fuser is warm; if it does not, replace the engine board. If the signal is OK, replace the LVPS.

Fuser: 923 or 924 Error

Check the connection and continuity of the cable from the fuser exit sensor board to engine board J8. Check the thermistor condition and connection.

Check the thermistor resistance at engine board J8-3 to J8-4. It should be from 100K Ohms to 260K Ohms when cold; it may be as low as 2.3K Ohms when hot but increase quickly as the fuser cools.

Honeycomb

(Areas of the page are covered by faint 6 mm circles.)

This print defect is usually caused by the print cartridge. If it is not the problem, verify that the tab on the transfer roll housing is touching the contact on the HVPS; the transfer roll housing should have continuity to ground. Make sure the HVPS ground lead to the side frame is in place and making good contact.

Horizontal Void or Streak

This is usually due to the cartridge not being installed correctly. Check the printhead area for obstructions, and check the mechanical workings of the print cartridge and printhead shutter. If nothing is found *see* “Blank Page” on page 16 and follow those instructions.

Host Printing Problems

You are here for one of the following reasons:

1. Host (twinax or coax) printing problems.
2. 97x errors (if 977, go to “Network Card 977 Errors” on page 25)
3. An IPDS card error, such as “RAM Check”, printed out on a sheet of paper. Install new IPDS memory. If that does not fix the problem, install a new IPDS card.

Follow the following steps. After each step, check if the problem is fixed. If the problem is fixed, leave this procedure and perform more verification procedures.

Note: This procedure deals with the Host Card and the IPDS card. Refer to “Host Attachment Card / IPDS Card Removal” on page 82 as needed.

1. Ask the customer to print a different host job (twinax or coax) that has printed on this printer before. If that job prints OK, there is a problem with the other job that failed.
2. For twinax, check the station address. For coax, try another port.
3. Print out your non-host menu settings

   MENUS
   MORE
   TEST MENU

   Mark the printout with a “1”. If you replace an Engine Board or a RIP Board, you will need to reset the settings on this Printout 1.
4. Look at Printout 1 and ensure that:

   a. Network 1 PS SmartSwitch=OFF

      Network 1 PCL SmartSwitch=ON.

      If either setting is wrong, correct it using the SETUP MENU/Network Setup menu.

   b. Print out your host menu settings (1page with SCS-only, 2 pages with IPDS):

      MENUS
      MORE
      NETWORK MENU 1
      TEST MENU

PRINT MENUS (THEN PRESS THE READY BUTTON)

Mark the first page with a 2. If IPDS, there is another page which you should mark 3. If you replace a Host Card (coax or twinax) or an IPDS card, you will need to reset the settings on these Printouts 2 and 3.

c. Reseat the host card in the lower Network Menu 1 connector J6. (See “RIP Board” on page 108.) Bad connection is a common cause of these problems.

d. There is a green LED on the back of the host attachment card just above the Coax or Twinax Connector. It is labeled “CU”. When this LED is ON, the card is receiving and accepting POLLs from the host.

With the host cable (twinax or coax) attached and the POST complete, observe the green CU LED.

- If the LED is on or blinking, your host attachment card is receiving polls from the system. If you have an IPDS card, ensure that the connection with the Host Card is OK. Then try reseating the host attachment card again. Ensure that the grounding screw is installed. If you still have a problem, try a new IPDS memory SIMM, a new host attachment card, or a new IPDS card.

- If the LED is OFF, continue.

Note: The share light is only used for special circumstances. If the Share light and the CU light are both on after POST, install a new host attachment card.

e. Check for +5VDC on B24 of J6. If the voltage is incorrect, replace the engine board. (See “RIP Board, Inner EMC Shield, and Engine Board Removal” on page 91.)

f. The host attachment card receives the correct voltage, but the printer is not communicating with the host.

- For twinax, ensure that other devices on the line are OK.

- For coax, ensure that other devices on or attached to the controller are OK. Also ensure that the configurations are correct. Do not continue until you have verified all of this.

If the printer has an IPDS card:

1. Remove the IPDS card from the host attachment card or an IPDS memory SIMM problem.
2. Install the host attachment card without the IPDS card.
3. If the lights are OK now, you have an IPDS card problem. Ensure that the memory SIMM on the IPDS card is seated. If this does not fix the problem, try new IPDS memory. If you still have a problem, install a new IPDS card. Then tailor the configuration information, using printout 3 you made at the beginning of the MAP.

LAN Problems

You cannot find a printer or network problem, but jobs still do not print.

If the network card checks out successfully, the problem may be with the hardware or software outside of the network card. Below are some suggestions to the customer for checking hardware and software for possible problems. Refer the customer to the *Network Printer Utility Guide*, SA40-0822, to find the problem. This guide is shipped with printers that have LAN INAs pre-installed.

- Make sure that the desired network protocol is enabled from the printer operator panel.
- Verify proper print queue and printer driver configuration
- Verify that the adapter port has been associated
- Verify correct installation of software utility
- Single route broadcast is not supported across network bridge, if bridge is used
- Server problem; check print server installation and configuration using the appropriate system guide to operations.

Light Print

Light print is frequently caused by a worn out print cartridge. Clean the transfer roll by powering on and off two or three times, leaving the

printer on for about two minutes each time. Other causes are the same as for “Blank Page”. *See* “Blank Page” on page 16.

Make sure Print Darkness on the customer Setup menu is set to Normal or Dark. Increasing the diagnostics mode Print Contrast setting will darken print further.

PostScript emulation output may appear lighter than PCL emulation output or a test print; this is not a defect. Verify on the Print Test that the print is too light before performing service.

Network Card 977 Errors

Note: Note: All network card errors are recorded as 977 in the error log. If you are here because there are 977 errors in the log, POR several times to recreated the actual 97x error. If the 97x error on the operator panel is not a 977, follow the instructions in the Diagnostic table. See “Diagnostic Information” on page 5.

1. Determine where the error is for the Network card (in J6, the lower connector; twinax or coax) or for the Network 2 card (in J12, the upper connector; INA for LAN attachment). This information should be posted with the error. See “RIP Board” on page 108.
2. Remove the suspect card (coax/twinax or LAN). Reseat the card. If this fixes the problem, stop here.
3. Check for +5VDC at pin B24 (upper right pin?) at the RIP board connector (J6 or J12). If the voltage is incorrect, replace the engine board (“RIP Board, Inner EMC Shield, and Engine Board Removal” on page 91).
4. If the +5VDC is OK, you have a problem with the card.
    - For Network 2 errors, install a new LAN card. Your customer will need to tailor his Network 2 Menu setting on the new card.
    - For Network 1 cards, go to “Host Attachment Card / IPDS Card Removal” on page 82.

Network Wrap Tests

Token-Ring with Shielded Twisted-Pair Cable: Disconnect the LAN cable from the electrical outlet, leaving it connected to the printer network card.

Ethernet 10Base-2: Attach a 50 Ohm BNC terminator cap to each end of the T-connector. The customer may be able to provide this cap.

There is no wrap test for Token-Ring with Unshielded Twisted-Pair cable or for Ethernet 10Base-T.

POR the printer. If the printer completes POR successfully, the printer, network card, and the port to the LAN are working correctly. If the customer still has a problem printing, *see* “LAN Problems” on page 24.

Output Bin Sensor

Examine the bin area for obstructions or damage. Run the diagnostic sensor test.

> **Note:** There is an output bin sensor on the 3116-002 and 3116-003. It is not on the 3112-001 or the 3116-001.

Make sure the plastic bails and guide are in good condition and that they guide the sensor flag out of and into the sensor as paper passes into the bin. On the sensor, the voltage from pin 2 to pin 3 (pin 1 is the bottom pin) should change from 0 to +5VDC as the sensor is blocked and unblocked. Pin 1 should always measure +5VDC.

Replace the sensor, the sensor card or the operator panel/bin sensor cable as necessary.

Operator Panel Problem

> **Note:** If the printer is in “Menus Disabled” mode, you can activate the menus by powering on the printer with the Return button and the top button pressed. Repeat the POR procedure to disable the menus again after service. If you need to change the displayed language, use the Setup Menu.

Possible causes: failed LCD or operator panel card, cable or connector problem, or engine board problem.

Replace the operator panel if POR stops with half rows of pels displayed.

Run the diagnostic tests for the LCD and for the buttons. If only some buttons or pels work, replace the operator panel.

If the printer beeps 5 times at POR, or if the operator panel is blank: check for +5VDC at pin 4 of the cable connector at the operator panel, and also at engine board J1-4. Replace the operator panel or the cable if they are the problem. If the voltage at the engine system board is incorrect, check that the LVPS is providing +5VDC at J4-7, J4-9, and J4-11, and replace the LVPS if its output voltages are wrong.

Paper Feed Problem, 500-Sheet Second Tray

Remove the module and inspect the tray, the module D-roll and the gear train. Make sure the gear train is meshing with the drive gear at the bottom of the printer. Look for other mechanical problems or damage. Make sure the printer and module auto-connectors mate properly when the module is installed.

If the paper is not being picked, run the Print Test with the RIP Board removed. Check for +34VDC at engine board J15-2. You can test the torquer motor by shorting engine board J15-1 to ground (J15-3).

Paper Feed, Base Printer

Run the print test or the diagnostic paper feed test and carefully examine the area of the problem.

If paper is not feeding, make sure the paper is in the tray correctly and is not damaged or stuck together. With 500-sheet trays, make sure the tension wheel is set high enough to give good contact between the D-roll and the paper stack.

If paper is not feeding or is feeding continuously with no gaps between pages, remove the paper tray and the RIP board. Press switches 1 and 3 on the paper size switch assembly. Watch the D-roll as you run the Print Test with RIP Board removed. One of the following will occur:

- The D-roll will make one complete revolution and stop with the flat side down. This indicates that the paper feed magnet and gear train are working correctly.
- The D-roll will turn continuously. There is a possible short to ground of the leads between the paper feed magnet and engine board. Examine the condition of the paper feed magnet leads, and replace the magnet if necessary. If no problem is found, replace the engine board.

- The D-roll will not move at all. Check the paper feed magnet adjustment. If the adjustment is correct, either the paper feed magnet is defective or the engine board signal is incorrect. Check the resistance of the paper feed magnet J14-1 to J14-2 for 100-250 ohms. If the resistance is correct, replace the engine board.
- The D-roll will move slightly but will not complete an entire revolution. This indicates a bind or defect in the gear train.

If paper is jamming, clean the paper path of obstructions or repair any damaged parts. Very thin or thick paper, labels, transparencies, or card stock will have a higher jam rate than regular xerographic paper. Check the condition of the paper in the tray and verify that the tray is installed correctly. If the paper feeds but stops undamaged in the paper path run the input and exit sensor test. Check for +5VDC at the input sensor (engine board J9-6) and exit sensor (engine board J8-6) with paper present. Check continuity on the cable before replacing a sensor.

If paper is curling badly enough to cause a problem feeding or stacking, *see* “Fuser Temperature And Warm-Up Time” on page 43.

Paper Feed, Duplex Unit

Check that all gears and belts are working correctly both in the duplex unit and on the tray top cover, and that the gear on the tray top cover correctly engages the gear on the duplexer.

If paper is jamming in the table cover area, make sure the table cover is properly installed. Run diagnostics Duplex Test 1 to make sure the paper is feeding far enough into the duplex unit before reversing. Examine the condition of all rollers.

If paper is stopping or jamming as it is fed back across the top of the paper tray, run diagnostics Duplex Test 2 to make sure there is no slippage in the paper path. Make sure the paper tray top cover is not damaged. Cold paper curl can also cause jams here; *see* “Fuser Temperature And Warm-Up Time” on page 43.

If paper is jamming at the front exit of the printer, inspect the duplex exit selector switch and the linkage to the printer exit deflector. Check the switch by removing the duplex top cover and table cover and reinstalling the duplexer in the printer. Check for +5VDC at duplex system

board J15-10. The voltage will change from 0VDC to +5VDC as the selector lever is moved. Also *see* “23 Paper Jams” on page 18.

Paper Feed Problem, Envelope+ Feeder/ 100-Sheet Auxiliary Feeder

Check for the following: paper or envelope jammed in the feed path; missing hold-down weight; adjustable guide out of position; feeder cable loose, disconnected, or plugged in the wrong connector; feeder incorrectly installed; worn or damaged rollers or gears; warped or damaged envelopes used; envelopes improperly installed (envelope flaps must rest against the paper edge guide); envelopes other than 20 or 24 pound used in the Envelope+ Feeder; paper other than 20 or 24 pound used in the 100-sheet auxiliary feeder; envelopes interleaved with paper.

Run the diagnostics Envelope Feed test and make sure the feed magnet is being energized. If not, check the resistance of the magnet at J10-1 to J10-2 on the feeder cable; the resistance should be from 105 Ohms to 155 Ohms. If the magnet is good, reconnect the cable and monitor the voltage between the two pins of the connector while running the Envelope Feed test; if the voltage does not increase momentarily as the magnet is picked, replace the engine board.

Check the adjustment of the feeder magnet. If paper is being bent or double-fed, check the adjustment of the feeder restraint spring.

Printhead

> **Note:** The printhead is a sealed unit. It contains no internal parts that can be replaced or adjusted.

Verify the presence of the following voltages: +24VDC at engine board J2-1, +5VDC at engine board J11-4, and +5VDC at engine board J12-8. If these voltages are not correct, replace the engine board.

Verify the continuity of the fan/mirror motor cable, the hsync cable, and the laser cable.

934 and 935 errors: Check engine board J2-5 during a POR; the voltage should be between +2VDC and +4VDC for about 7 seconds after the main motor turns on. If the voltage is incorrect, replace the engine

board. If the voltage is correct, check the continuity of the fan/mirror motor cable. Replace the printhead if the cable is good.

Paper Size Sensing Problem

(The printed area does not fit on the page, or the paper size cannot be changed from the operator panel.)

Make sure the paper tray and its stops are undamaged. Make sure the cable to the paper size switch is connected correctly. With the paper tray removed, the resistance of the paper size switch should be infinite. With the tray installed, the resistance of the switch varies with the paper size.

For **Tray 1**, remove the front cover, disconnect the cable from the sensor and measure the resistance between the two pins on the sensor board.

For **500-sheet** option, remove the RIP Board, disconnect J15 from the engine board, and measure between J15-3 and J15-4 on the cable.

If the readings do not match the following within 5% replace the paper size sensor.

Tray installed and set to:	
A5	1.4K Ohms (tray 1 only)
B5	2.0K Ohms
10.5”	3.0K Ohms
11”	4.7K Ohms
A4	8.0K Ohms
13” or 14”	17.8K Ohms (legal tray)

Regularly Spaced Marks

This is caused by a defect on one of the rolls or gears in the print process. The damaged part can be determined by the spacing of the marks according to the following table. Find and replace the damaged part.

Component	Print Defect Spacing on Page
PC Drum (part of print cartridge)	125.7 mm
Transfer Roll	53.1 mm
Fuser Hot Roll	78.9-79.2 mm
Fuser Backup Roll	69.1 mm
Charge Roll (part of print cartridge)	37.1-37.7 mm
Developer Roll (part of print cartridge)	40.0mm
Prealigner Feed Roller	68.5 mm
Auxiliary Feed Roller	68.5 mm

Spacings other than the ones listed could be caused by damage or a bind in the gear train.

Residual Image

Residual image--the “walking” of a leftover image down the page--is probably the result of failed erase lamps not discharging the photoconductor, or of a failed cleaner inside the print cartridge. It can also be caused by a failed fuser hot roll retaining toner and redepositing it on the page. Check that the erase lamp voltage at engine board J9-1 is +24VDC and that the cable has continuity.

To test the erase lamps, jumper engine board J9-2 to ground.

Random Marks

Random marks are nearly always due to a mechanical problem or due to foreign matter loose in the printer or in the print cartridge. Inspect and clean the inside of the printer carefully and correct any problems found.

Skew, all edges

If the test print frame is parallel to all edges of the page but the margins are not all the same width. *See* “Print Registration” on page 47.

If the test print frame is not parallel to the left and right edges of the paper, the paper has skewed in the paper path. Check the paper path for obstructions. Make sure the paper in the tray is loaded properly and is undamaged. Check the prealigner, drive, and auxiliary rollers, springs, and backup rollers for dirt, wear, or damage; refer to the parts catalog for repair kits for broken bellcrank spring attachment hooks on the sideframe. Make sure all the bellcrank assemblies pivot freely. Check the gear train for damage or binds.

Skew, top and bottom only

If the test print frame is parallel to the left and right edges of the paper but not parallel to the top and bottom, the printhead skew needs to be adjusted. *See* “Printhead Skew” on page 61.

Stalled (diamonds on display)

Check the continuity of the cable from J1 on the engine board to the operator panel. Next reseat the ROM and memory SIMMs and POR. This condition can also occur if the RIP and engine board are not seated or their connectors are damaged.

If the problem is still present, replace one at a time the:

1. ROM SIMM
2. Engine board
3. RIP Board

Vertical Void or Streak

Do a developed image test to determine if the defect is occurring before or after the transfer process.

If you see the defect on the photoconductor, check the operation of the printhead shutter and clean the printhead window with a lint-free cloth folded over a cotton swab; do not use a bare swab and do not use any cleaning fluids or water on the printhead window. Inspect the HVPS contacts.

If the image on the photoconductor is good, inspect the fuser rolls and transfer roll. Make sure the left transfer roll bearing is contacting the contact from the HVPS. Make sure the HVPS contacts are clean and spring back when pressed.

Diagnostic Aids

Diagnostics Mode

To run the remainder of the printer diagnostic tests described in this chapter, you must put the printer in Diagnostics mode.

To enter Diagnostics mode:

1. Turn the printer off.
2. Press and hold the Ready and Return buttons. Then turn the printer on. The printer performs the Power-On Self Test.
3. Release the buttons when [Performing Self Test] is displayed.
4. You can exit Diagnostics mode without a POR by selecting [Reset Printer].

Diagnostics Mode Menu Structure

The following is the Diagnostics mode menu structure, The indented items are submenus available under the main menu items, which are in capital letters on the operator panel. Menu items referring to options will only be present if those options are installed. Menus with more than four items will use [MORE] on the fourth operator panel button to access the next screen of selections.

PRINT TESTS

Print Tests 1

Print Tests 2

Print Tests 3

Envelope Print Tests

PRINT REGISTRATION

Left Margin

Top Margin

Bottom Margin

Quick Test

HARDWARE TESTS

- LCD Test
- Sensor Tests
  - Toner Low
  - Output Bin
  - Input
  - Exit
  - Cover Open
- Button Test
- Wrap Tests
  - Parallel
  - Serial
- Memory Tests
  - DRAM
  - ROM

PAGE COUNTS

- Page Count
- Permanent Page Count
- Maintenance Count

PAPER FEED TESTS

- Tray 1
- Tray 2
- Feeder
- Manual

DUPLEX TESTS

- Top Margin
- Duplex Quick Test
- Duplex Feed 1
- Duplex Feed 2

DEVICE TESTS

- Disk Test/Clean
- Quick Disk Test
- Flash Test

PRINTER SETUP

- Fuser Temperature
- Warm-Up Time
- Envelope Enhance
- Auto Clean
- Auto Clean Frequency
- Auto Clean Delay
- Transfer
- Print Contrast
- Charge Roll
- Defaults

ERROR LOG

RESET PRINTER

Diagnostics Mode Tests

Auto Clean

Auto Clean needs to be turned on if there is an unacceptable amount of toner being deposited on the back of the page. When Auto Clean is on, after printing the number of pages specified in Auto Clean Frequency, the printer will pause the number of seconds specified in Auto Clean Delay. This pause minimizes the toner accumulating on the fuser cleaner.

1. Enter Diagnostics mode.
2. Select [PRINTER SETUP].
3. Select [Auto Clean].
4. Select [On] or [Off].
5. Press Return to return to Diagnostics mode main menu.

Auto Clean Frequency

This can be set from 10 to 255 pages with a default of 50.

1. Enter Diagnostics mode.
2. Select [PRINTER SETUP].
3. Select [Auto Clean Frequency].
4. Select [+] or [-] to display the frequency desired.
5. Select [Save].
6. Press Return to return to Diagnostics mode main menu.

Auto Clean Delay

This can be set from 1 to 60 seconds with a default of 1.

1. Enter Diagnostics mode.
2. Select [PRINTER SETUP].
3. Select [Auto Clean Delay].
4. Select [+] or [-] to display the delay desired.
5. Select [Save].
6. Press Return to return to Diagnostics mode main menu.

Button Test

To test the operator panel buttons:

1. Enter Diagnostics mode.
2. Select [HARDWARE TESTS].
3. Select [Button Test].
4. Press each button. [Closed] is displayed until the button is released. Then [Open] is displayed.
5. Press Return to return to the Diagnostics mode main menu.

Charge Roll

This setting varies the charge roll bias. It is used to reduce background on the output. In general, if there is background and the environment is hot and humid, change the setting to low; if the environment is cool and dry, change the setting to high. If the background is not reduced, try changing the setting the other way.

1. Enter Diagnostics mode.
2. Select [PRINTER SETUP].
3. Select [Charge Roll].
4. Select [High], [Medium] or [Low].
5. Press Return to return to the Diagnostics mode main menu.

Defaults

Allows setting the following defaults to U.S. or Non-U.S. values.

U.S.	NON U.S.
Letter size paper	A4 paper
# 10 envelopes	DL envelopes
Symbol Set Roman-8	Symbol Set PC-850

1. Enter Diagnostics mode.
2. Select [PRINTER SETUP].
3. Select [Defaults].
4. Select [U.S.] or [NON U.S.].
5. Press Return to return to Diagnostics mode main menu.

Disk Test/Clean

This is a two hour test that should be performed only on a disk that contains bad data and is therefore unusable.

This test destroys all data on the disk by doing a multi-pass write/read on every block of the disk. Bad blocks are flagged and removed from use. If over 2000 bad blocks are found, the test stops and the display indicates the disk must be replaced.

A message describing test progress is displayed during the test.

1. Enter Diagnostics mode.
2. Select [DEVICE TESTS].
3. Select [Disk Test/Clean].
4. Select [CONTINUE] to start the test, or [CANCEL] to return to Diagnostics mode main menu.
5. Select [CANCEL] to interrupt the test.
6. Press Return to return to Diagnostics mode main menu.

Duplex Feed 1 Test

This test checks for slipping paper problems. It verifies that the paper is entering the duplex unit far enough for the trailing edge to clear the selector fingers before the paper reverses direction.

1. Enter Diagnostics mode.
2. Select [DUPLEX TESTS].
3. Select [Duplex Feed 1].
4. Select [Tray 1], or [Tray 2].

Note: Paper feeds all the way into the duplex unit and stop.

5. The message [Clear Paper] appears on the display.
6. Slide the tray extension all the way out until it stops.
7. Push a small screwdriver through the lower end of one of the ventilation slots and through the sheet of paper fed in under the slot.
8. Open the cover and remove the sheet of paper.
9. Measure the distance from the mark on the paper to the trailing edge of the paper. If the mark, or hole, is more than 85 mm from the trailing edge, there is a paper slipping problem with the duplex unit paper feed.

Duplex Feed 2 Test

This test verifies that paper feeds through the duplex unit properly and tests the stop point of the page as it feeds back over the top of the duplex paper tray.

1. Enter Diagnostics mode.
2. Select [DUPLEX TESTS].
3. Select [Duplex Feed 2].
4. Select [Tray 1] or [Tray 2].

   Note: Paper feeds all the way into the duplex unit and then feeds out and stops on top of the paper tray.

5. The message [Clear Paper] appears on the display.
6. Open the printer top cover.
7. If you are doing the test with legal size paper, open the top cover of the duplex unit.

8. Carefully remove the duplex unit from the printer without disturbing the position of the paper on the top of the duplex tray.
9. Without changing the position of the page, hold it to the top of the paper tray and remove the paper tray.
10. Measure from the leading edge of the page to the leading edge of the paper stack in the tray. This measurement should be 75 mm or less. If it is larger than 75 mm, there is a drive problem in the duplex unit or in the tray top cover.
11. Select [CONTINUE].
12. Perform the test several times to verify that the measurement is accurate.
13. Press Return to return to Diagnostics mode main menu.

Envelope Enhance

Use this procedure to set the fuser solenoid power level to low, medium, or high. Increase the level to reduce envelope wrinkling, or decrease the level to reduce solenoid noise.

1. Enter Diagnostics mode.
2. Select [PRINTER SETUP].
3. Select [Envelope Enhance].
4. Select [Low], [Medium], or [High].
5. Press Return to return to Diagnostics mode main menu.

Envelope Print Test

Use Envelope Print Test to test the Envelope+ or Auxiliary feeder.

Envelope Print Test generates one printout: a page of ripple print. Printing will occur only on the first page or envelope.

1. Enter Diagnostics mode.
2. Select [PRINT TESTS].
3. Select [Envelope Print Test].
4. Select [Single] or [Continuous].
5. Select [CANCEL] to stop continuous print.
6. Press Return to return to the main diagnostic menu.

Error Log

The error log records the last 6 “2X Paper Jam” or “9XX Service” errors. In a full log, position 6 is the oldest error. If more than 6 errors are received, the oldest error is discarded. If the same error occurs consecutively it is recorded only once.

All 97X Network Card errors are logged as 977.

1. Enter Diagnostics mode.
2. Select [ERROR LOG].
3. Select [CLEAR] and then [CONTINUE] to clear the error log.
4. Press Return to return to Diagnostics mode main menu.

Flash Test

This test writes to and reads from the flash memory. It destroys all data stored in the flash SIMM.

1. Enter Diagnostics mode.
2. Select [DEVICE TESTS].
3. Select [Flash Test].

   The operator panel will display [Passed] or [Failed].

4. Press Return to return to Diagnostics mode main menu.

Fuser Temperature And Warm-Up Time

These settings allow adjustment of the fuser to correct problems with paper curl or melting letterheads.

Paper curl in which the top and bottom of the page curl toward the printed side (hot paper curl) can be corrected by reducing the fuser temperature. Reduce the setting from Normal to No Boost; if necessary, reduce the setting further to Low Temperature. Verify that the toner is being adequately fused to the paper at the new temperature setting.

Paper curl in which the edges of the paper curl toward the printed side (cold paper curl) can corrected by increasing the fuser warm-up time. Use the lowest setting that corrects the problem. Setting “0” is the factory default and is the shortest warm-up time. Setting “5” increases warm-up time by 90 seconds; lower settings increase the time proportionately less. Settings other than “0” may reduce throughput. Use the [+] or [-] key to change the number and then select [SAVE].

Melting letterheads may be prevented by reducing the fuser temperature as described above for paper curl.

Fuser Temperature

1. Enter Diagnostics mode.
2. Select [PRINTER SETUP].
3. Select [Fuser Temperature].
4. Select [Normal], [No Boost], Or [Low Temperature].
5. Press Return to return to the Diagnostics mode main menu.

Fuser Warm-up Time

1. Enter Diagnostics mode.
2. Select [PRINTER SETUP].
3. Select [Warm-Up Time].
4. Select a setting of “0” through “5”. Use the + or - key to change the number. 0 is the shortest fuser warm-up (factory setting). 5 is the longest fuser warm-up.
5. Press Return to return to the diagnostic menu.

LCD Test

To test the operator panel display:

1. Enter Diagnostics mode.
2. Select [HARDWARE TESTS].
3. Select [LCD Test].
4. Select [Single] or [Continuous].
5. The display goes through a continuous sequence of turning pels on and off.
6. Press Return to stop continuous LCD test.
7. Press Return to return to the Diagnostics mode main menu.

Maintenance Kit Count

This non-displayed counter must be reset after the maintenance kit is replaced to prevent the [80 Scheduled Maintenance] message from displaying when the machine is turned on.

1. Enter Diagnostics mode.
2. Select [PAGE COUNTS].
3. Select [Maintenance Count].
4. Select [Reset] to set the count back to “0”.
5. Press Return to return to the Diagnostics mode main menu. See “Usage Kit Information” on page 119.

Memory Tests

1. Enter Diagnostics mode.
2. Select HARDWARE TESTS].
3. Select [Memory Test].
4. Select either [DRAM] or [ROM].
5. Select [Single] or [Continuous].
6. The display will indicate [PASSED], or [FAILED].
7. Select [CANCEL] to stop continuous memory test.
8. Press Return to return to Diagnostics mode main menu.

Page Count

To view or set the page count:

1. Enter Diagnostics mode.
2. Select [PAGE COUNTS].
3. Select [Page Count].
4. Choose any number between 0000000 and 9999999 by Selecting [Next] to move the cursor under each digit. Select [+] or [-] to select the number you want in each digit.
5. Select [SAVE] to save the page count displayed.

Paper Feed Tests

This test allows you to observe the drive gear train and feed paper through the printer to check for broken gear teeth, watch the paper path, or check the erase lamps.

Note: You may want to remove the gear cover before starting this test so you can observe the motor gears.

1. Enter Diagnostics mode.
2. Select [PAPER FEED TESTS].
3. Select [Tray 1], [Tray 2], [Feeder], or [Manual].
4. Select [Single] or [Continuous].
5. Select [CANCEL] to stop continuous.
6. Press Return to get back to Diagnostics mode main menu.

Permanent Page Count

The permanent page count can be displayed only. It cannot be modified or reset by the customer or servicer.

1. Enter Diagnostics mode.
2. Select [PAGE COUNTS].
3. Select [Permanent Page Count].
4. Press Return to return to Diagnostics mode main menu.

Print Contrast

This setting varies the developer bias to vary the print darkness. If the Print Darkness setting on the customer menu does not allow the darkness to be set correctly, this setting can increase or decrease the entire darkness range.

1. Enter Diagnostics mode.
2. Select [PRINTER SETUP].
3. Select [Print Contrast].
4. Select [Low], [Medium], or [High].
5. Press Return to return to the Diagnostics mode main menu.

Print Registration

Use Print Test 1 or the Quick Test to evaluate print registration. Adjust the registration so the tips of the diamonds are at the top and bottom edges of the page and the printout is centered left to right.

Verify that the top margin is correct before adjusting the bottom margin.

1. Enter Diagnostics mode.
2. Select [PRINT REGISTRATION].
3. Select one of the following: [Left Margin], [Top Margin], [Bottom Margin].
4. The value of the margin you selected is shown.
5. Margins:
   - **Left Margin** can be set between -23 and +23. Changing the number by one moves the margin 1/75 inches. Moving the number in a positive direction moves the margin toward the right and negative moves the margin to the left.
   - **Top Margin** can be set between -20 and +20. Changing the number by one moves the margin by 1/75 inches. Moving the number in a positive direction moves the margin down the page and widens the top margin. Moving the number in a negative direction moves the text up the page and narrows the top margin.
   - **Bottom Margin** can be set between -20 and +20. Moving the number in a positive direction moves the margin down and narrows the bottom margin. Moving the number in a negative direction moves the text up the page and leaves a wider bottom margin.
6. Select [+] to move the number in a positive direction or select [-] to move the number in a negative direction. Select [SAVE] to save your settings when they are correct.
7. Select [Quick Test] to check your settings.
8. Press Return to return to the Diagnostics mode menu.

Print Test 1

Print Test 1 generates one printout similar to the test page. This test uses paper from tray 1 only. Print Test 1 will not duplex.

To run Print Test 1:

1. Enter Diagnostics mode.
2. Select [PRINT TESTS].
3. Select [Print Test 1].
4. Select [Single] or [Continuous].
5. Select [CANCEL] to stop continuous print.
6. Press Return to return to the main Diagnostics mode menu.

Print Test 2

Print Test 2 generates two printouts: a page similar to the test page, and a fine dot pattern which can be used to evaluate banding or other print quality problems.

Print Test 2 will duplex if the duplex option is installed.

To run Print Test 2:

1. Enter Diagnostics mode.
2. Select [PRINT TESTS].
3. Select [Print Test 2].
4. Select [Single] or [Continuous].
5. Select [Cancel] to stop continuous print.
6. Press Return to return to the main diagnostic menu.

Print Test 3

This test generates 2 printouts: a solid black page, and a dot pattern that can be used to evaluate print quality. Print Test 3 will not duplex.

1. Enter Diagnostics mode.
2. Select [PRINT TESTS].
3. Select [Print Test 3].

4. Select [Single] or [Continuous].
5. Select [Cancel] to stop continuous print.
6. Press Return to return to Diagnostics mode main menu.

Quick Disk Test

This is a one minute test which performs a non-destructive write/read on one block per track on the disk. It tests the printer-to-disk communications, and the disk hardware and circuitry, but does only incidental testing of the disk surface itself.

The Quick Disk Test does not destroy data on the disk; existing data is read and stored prior to the testing of each track, and then rewritten after the track is tested.

1. Enter Diagnostics mode.
2. Select [DEVICE TESTS].
3. Select [Quick Disk Test].
4. The display will indicate [Test Passed] or [Test Failed].
5. Press Return to return to Diagnostics mode main menu.

Quick Test

The Quick Test is activated by pressing Ready from any screen while in Diagnostics mode, as well as being an entry under [PRINT REGISTRATION]. It provides a simple page alignment pattern that prints faster than the other print tests.

Sensor Test

1. Enter Diagnostics mode.
2. Select [HARDWARE TESTS].
3. Select [Sensor Test].
4. Select one of the following sensor tests: Toner Low, Output Bin, Input, Exit, or Cover Open.
5. When the sensor is blocked, [Open] will be displayed. Otherwise, [Closed] will be displayed.
6. Press Return to return to the Diagnostics mode main menu.

Top Margin and Duplex Quick Tests

The Top Margin and Duplex Quick Test are used together to adjust the duplex front-to-back registration. Make sure the non-duplex page registration is correct before adjusting the duplex top margin.

1. Enter Diagnostics mode.
2. Select [DUPLEX TESTS].
3. Select [Top Margin].
4. Select [+] or [-] to raise or lower the back image 0.01 inches per increment.
5. Press Return to return to the diagnostic menu.

The Duplex Quick Test is used to verify the Duplex Top Margin.

1. Enter Diagnostics mode.
2. Select [DUPLEX TESTS].
3. Select [Duplex Quick Test].
4. Press Return to return to the diagnostic menu.

There is some variation in the image position from sheet to sheet. Print three or four test pages at each setting.

Transfer

This setting varies the transfer voltage offset slightly. In normal environments it will not result in a visible difference in the printout. In extreme environments with unusual papers this setting may be helpful. Do not change this setting unless replacing the transfer roll assembly did not correct the problem.

1. Enter Diagnostics mode.
2. Select [PRINTER SETUP].
3. Select [Transfer].
4. Select [Low], [Medium], or [High].
5. Press Return to return to the Diagnostics mode main menu.

Wrap Tests

The Wrap Tests check the circuits used to communicate with the host computer.

To run the Wrap Test:

1. Turn the printer off.
2. Disconnect the interface cable.
3. Install the wrap plug in one of the interface cable connectors.
   Note: Install the parallel wrap plug part no. 1319128 for the parallel test or install the 25 pin serial wrap plug part no. 1329048 for the serial test.
4. Enter Diagnostics mode.
5. Select [HARDWARE TESTS].
6. Select [Wrap Test].
7. Select [Parallel] for the parallel port or [Serial] for the 25 pin serial port.
8. Select [Single] or [Continuous].
9. Select [CANCEL] to stop continuous.

A [Passed] message indicates the printer connection to the printer cable connector is good.

A [Failed] message indicates a defective RIP board.

Note: Ignore the number displayed after a failure is displayed.

10. Press Return to return to the Diagnostics mode main menu.
11. Turn the printer off, then remove the wrap plug from the interface connector.

Other Tests

Developed Image Test

Use the Developed Image Test to isolate print quality problems. You might have to practice this procedure several times to get the timing correct.

To run the Developed Image Test:

1. Open the front exit tray.
2. Print the test page.
3. As soon as the leading edge of the paper is visible coming out the front exit slot, turn off the printer.
4. Remove the print cartridge and look at the image on the photoconductor.

LAN Information

The printer may be connected to one of the following LAN types:

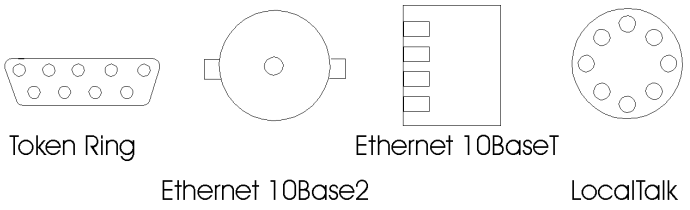
Token-Ring

Ethernet 10BaseT

Ethernet 10Base2

LocalTalk**

The Network external connectors are pictured below. The printer test page also indicates to which type of LAN the printer is connected.



Print Test Page

You can run the Print Test even if the printer is not attached to a computer. Use this test to check print and graphics quality and the version numbers of printer microcode. The first page of this test feeds from tray 1. Following pages continue to feed from this tray unless you change the paper source.

To run the Print Test:

1. Turn the printer on.
2. Select [MENUS].
3. Select [TESTS MENU].
4. Select [Print Test Page].
5. Select either [Single] for one page or [Continuous] for continuous test pages.
6. Select [Stop] when you want the continuous test to end.

Print Test with RIP Board Removed

Most meter measurements required during printer service will be on the engine board connectors, which are inaccessible with the RIP board in place. The printer has a service mode which allows you to test the printer without the RIP board installed. This verifies that the motors, sensors, printhead, and electrophotographic process are working correctly. In this mode, the operator panel has minimal function; service codes are not displayed and most error-handling is disabled (during normal operation these functions are handled by the RIP board).

Remove the RIP board and the inner EMC shield together and power on the printer (See “RIP Board, Inner EMC Shield, and Engine Board Removal” on page 91). The operator panel will have one button active which starts and stops the print test. The test consists of horizontal lines spaced about an inch apart down the page. This is a continuous print test; to print a single page press the start button twice.

Repair Information

This chapter explains how to make adjustments to the printer and how to remove defective FRUs.

Handling ESD-Sensitive Parts

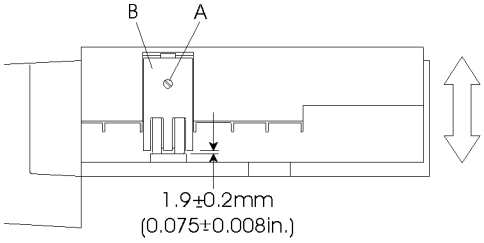
Many electronic products use parts that are known to be sensitive to electrostatic discharge (ESD). To prevent damage to ESD-sensitive parts, follow the instructions below in addition to all the usual precautions, such as turning off power before removing logic boards:

- Keep the ESD-sensitive part in its original shipping container (a special “ESD bag”) until you are ready to install the part into the machine.
- Make the least-possible movements with your body to prevent an increase of static electricity from clothing fibers, carpets, and furniture.
- Put the ESD wrist strap on your wrist. Connect the wrist band to the system ground point. This discharges any static electricity in your body to the machine.
- Hold the ESD-sensitive part by its edge connector shroud (cover); do not touch its pins. If you are removing a pluggable module, use the correct tool.
- Do not place the ESD-sensitive part on the machine cover or on a metal table; if you need to put down the ESD-sensitive part for any reason, first put it into its special bag.
- Machine covers and metal tables are electrical grounds. They increase the risk of damage because they make a discharge path from your body through the ESD-sensitive part. (Large metal objects can be discharge paths without being grounded.)
- Prevent ESD-sensitive parts from being accidentally touched by other personnel. Install machine covers when you are not working on the machine, and do not put unprotected ESD-sensitive parts on a table.
- If possible, keep all ESD-sensitive parts in a grounded metal cabinet (case).
- Be extra careful in working with ESD-sensitive parts when cold-weather heating is used because low humidity increases static electricity.

Adjustments

Envelope Restraint Spring On The Envelope+ Feeder

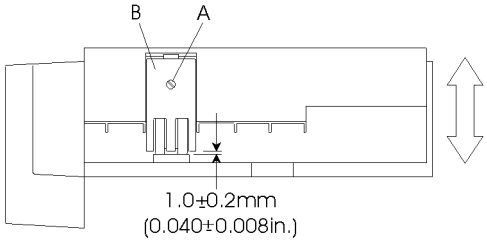
1. Loosen the mounting screw [**A**].
2. Position the spring [**B**] so it clears the separator roller by 1.9 +/- 0.2 mm (0.075 +/- 0.008 in.).
3. Tighten the mounting screw.



(Rear View)

Paper Restraint Spring On The 100-Sheet Auxiliary Feeder

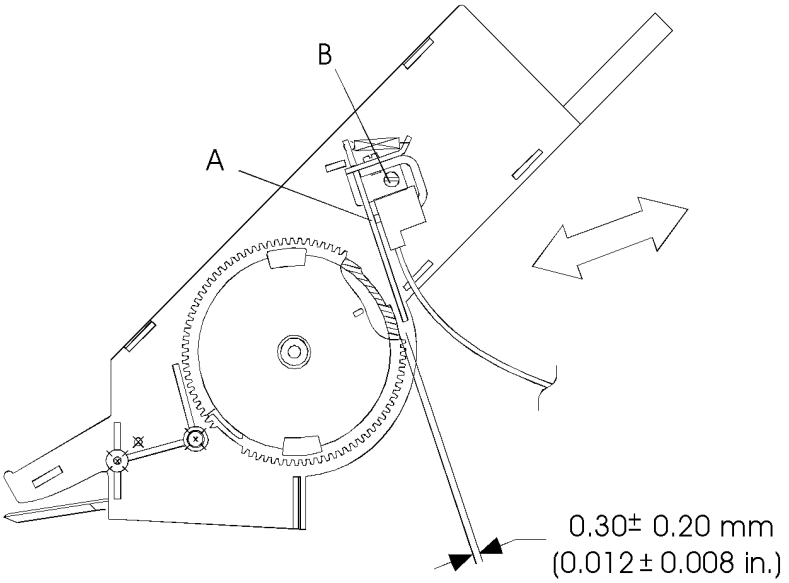
1. Loosen the mounting screw [**A**].
2. Position the spring [**B**] so it clears the separator roller by 1.0 0+/- 0.2 mm (0.040 +/- 0.008 in.).
3. Tighten the mounting screw.



(Rear View)

Envelope+ Feeder Magnet And 100-Sheet Auxiliary Feeder Magnet

1. Hold the armature [**A**] in the closed (coil active) position.
2. Loosen the mounting screw [**B**], and rotate the magnet assembly so the armature clears the clutch gear by 0.30 +/- 0.20 mm (0.012 +/- 0.008 in.).
3. Tighten the screw.
4. Check the adjustment on both sides of the gear.

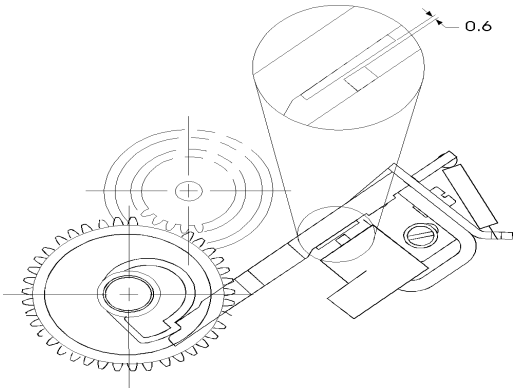


Paper Feed Magnet

1. Remove the RIP board. (See “RIP Board, Inner EMC Shield, and Engine Board Removal” on page 91.)The magnet is accessed through the holes in the right frame.
2. With the armature latched on the cam step check for 0.60 mm +/- 0.07 mm (0.024 in +/- 0.003) between the foam pad and the magnet pole piece.

   Note: Don’t let the sound deadening material on the armature interfere with the adjustment.
3. Keep the armature latched and loosen the magnet mounting screw.

   Note: The flat side of the D-roll is down when the feed is latched.
4. Insert feeler gage.
5. Rotate the magnet against the feeler gage.
6. Tighten the mounting screw.
7. The gage should pass between the foam pad and the magnet pole piece with moderate resistance.



Fuser Drive Gear Backlash

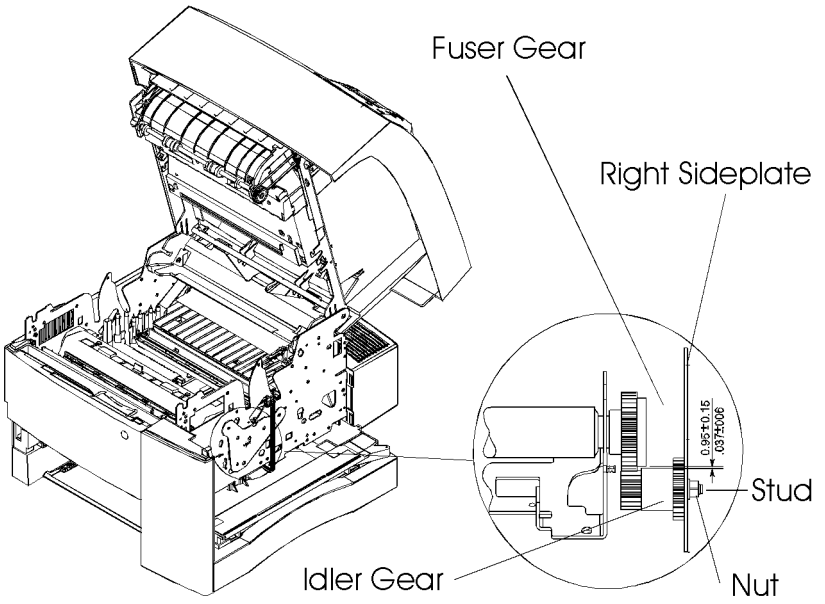
Fuser drive gear backlash is adjusted so that when gear #2 is held still, there is a slight amount of backlash in the fuser gear. Print quality can

be affected if the gears are too tight.

1. Remove the fuser cover.
2. Locate gear #2. It is the white adjustable gear-mounted to the side frame below the fuser gear.
3. Rotate the adjustable gear in one direction to check for backlash.

To adjust backlash:

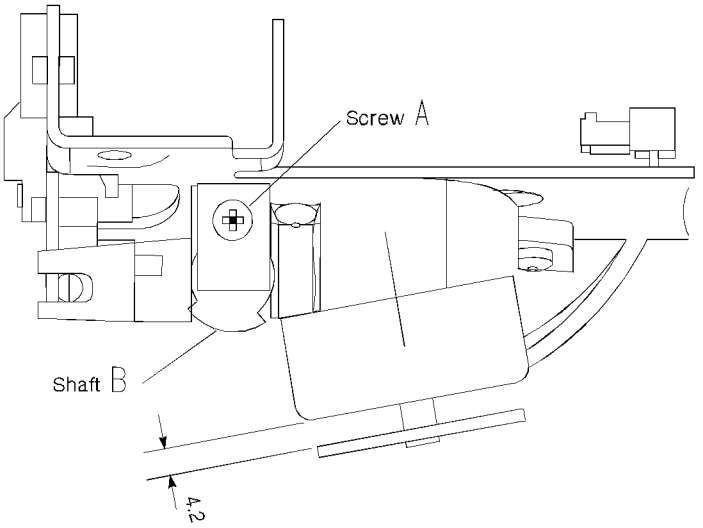
1. Loosen the nut on the idler stud.
2. Move the idler stud downward in its slot.
3. Insert a 0.95 mm (.037 in.) feeler gage between the gear shoulders from the front of the machine. You may need to use an angled or very small feeler gauge.
4. With the nut snug but not tight, tap the idler upward until the gage is snug between the gear shoulders.
5. Tighten the locking nut.
6. Check the clearance again; tightening may have altered the adjustment. Be sure the fuser gear can be rotated slightly when gear #2 is held still.



Fuser Solenoid

Note: The fuser solenoid must be mounted on the fuser for this adjustment and should be at room temperature.

1. Loosen screw [**A**].
2. Remove the rubber washer.
3. Rotate shaft [**B**] (eccentric) to obtain 4.2 mm +/- 0.2 mm (0.165 in. +/- 0.008 in.) air gap.
4. Tighten screw [**A**].
5. Replace the rubber washer.

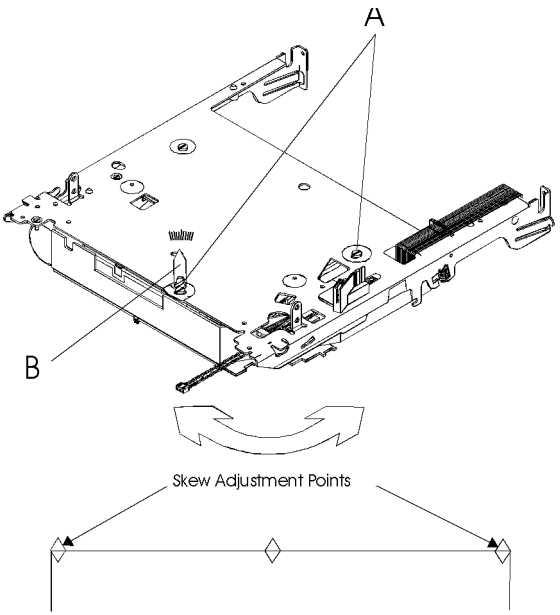


Printhead Skew

1. **3112-001 and 3116-001:** Remove the plug in the top cover.

   3112-002 and 3112-003: Open the paper exit stop. Unlatch and remove the spring-loaded exit stacker.

2. Loosen the screws [**A**].
3. Run Print Test 1 or the Quick Test on the Diagnostics Menu.
4. Move the pointer [**B**] to eliminate the skew. Moving the pointer toward the left raises the left adjustment point on the printout. Each mark is equivalent to one dot of the skew adjustment points.
5. Tighten the screws, and verify the adjustment.



Removals

Note: When there is artwork to support a procedure, it follows the text.

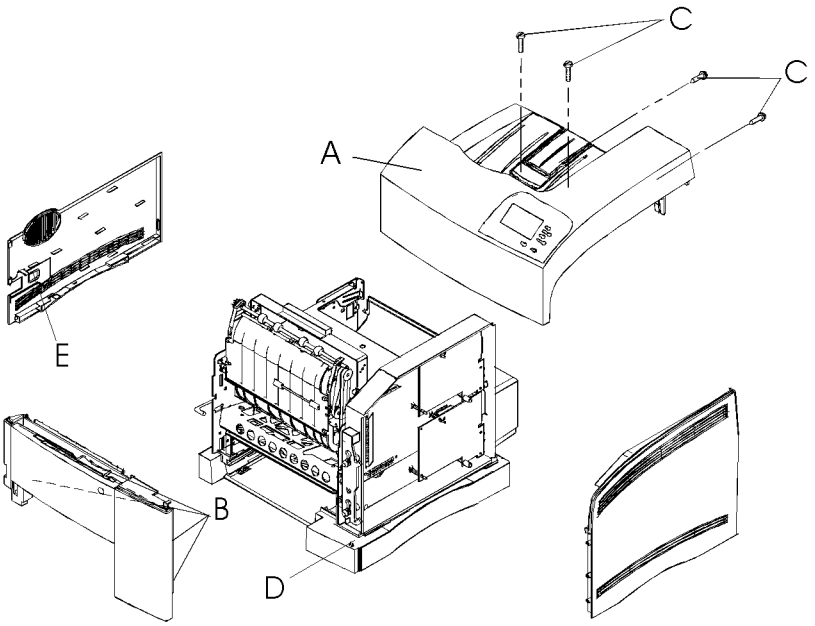
Covers

Right Cover Removal

1. Turn the printer off.
2. Remove all external trays.
3. Open the top cover.
4. Depress the latch and open the right cover.
5. Remove the E-clip from the rear pivot pin and lift the cover off the rear pivot pin.

Front Cover Removal

1. Unplug the power cord.
2. Remove the paper tray.
3. Open the top cover.
4. Open the right cover.
5. Release the latches [**B**]. You can reach the lower latches through the paper tray opening.
6. Lift the right side of the cover to disengage latch [**D**].
7. Slide the cover to the right to disengage the bracket from the posts.
8. Pull the front cover forward and disconnect the ground strap from the frame on the left side.

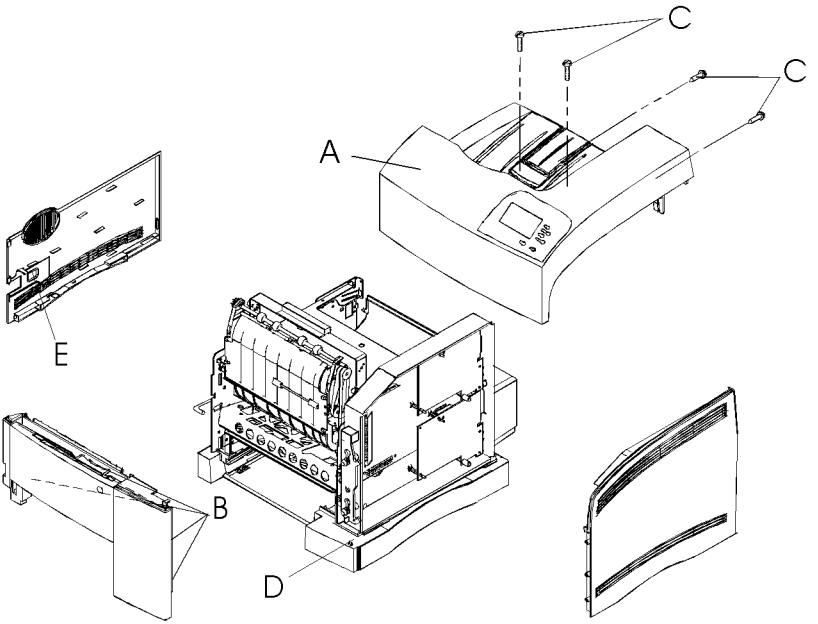

C
C
A
E
B
D

Left Cover Removal

1. Unplug the power cord.
2. Open the top cover and remove the print cartridge.
3. Remove the front cover.
4. Locate the latch [**E**] and lift the end to release it.
5. Push the top of the cover to the left.
6. Remove the cover by sliding it to the rear of the machine.

Top Cover Removal

1. **3116-002 and 3116-003:** Remove stacker plate by pulling upward.
2. Remove the top cover screws [**C**].
3. Lift the rear of the cover first, then the front, and lift the cover off.
4. Rest the cover on the machine and disconnect the operator panel cable.



14 in. 200-Sheet Paper Tray Top Cover

1. Push the tab where the left corner of the tray cover pivots.
2. Move the left tray cover pivot pin forward and then upward.
3. Remove the cover from the tray.

14 in. 500-Sheet Paper Tray Top Cover

1. Remove the two screws which secure the front trim panel.
2. Slide the trim panel to the rear to expose the tray cover pivot pins.
3. Lift the cover from the tray.

Transfer Roll Removal

1. Unplug the power cord.
2. Remove the print cartridge.
3. Remove the bearing cover from the left side of the transfer roll:

   Note: Do not touch the transfer roll surface.

   - Support the left bearing cover from the front with your left hand.
   - Use a small screwdriver to push the rear latch forward and release the bearing cover. This exposes the bearing on the end of the transfer roll.
4. Grasp the bearing on the end of the transfer roll. Lift slightly and move it to the left until the right end of the transfer roll shaft slides out of the right side bearing.
5. Remove the transfer roll.
6. Lift the right bearing straight up and out of the machine.

D-roll Assembly Removal

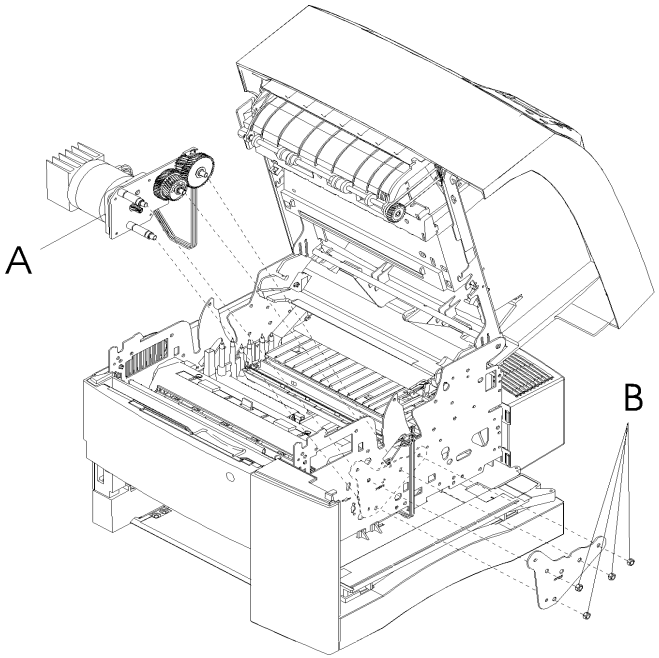
1. Unplug the power cord.
2. Remove the paper tray.
3. Remove the print cartridge.
4. Remove the fuser input guide.
5. Remove the transfer roll housing assembly.
6. Pull the D-roll firmly to the left to remove it.

Note: The D-roll is designed to be installed only once; if it is removed for any reason it should be replaced with a new one.

Note: It may take considerable force to install the new D-roll

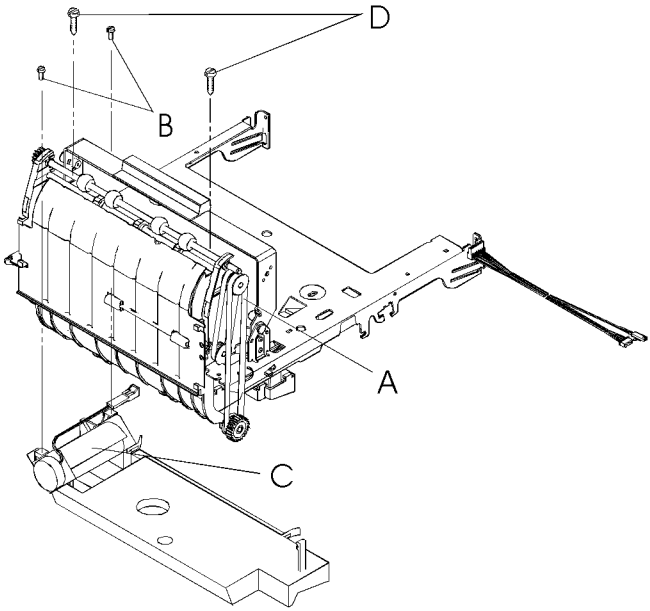
Drive Motor Removal

1. Unplug the power cord.
2. Remove the RIP board and inner EMC shield together.
3. Remove the engine board.
4. Remove the fuser input guide.
5. Remove the transfer housing assembly.
6. Remove the gear cover by releasing the rear latch and lifting up.
7. Remove the motor mounting nuts [**B**] and screws [**D**].
8. Work the motor out of the machine.



Fan/Redrive Removal

1. Open the top cover.
2. Remove the print cartridge.
3. Remove the top cover.
4. Remove the lower redrive shaft by disengaging the right end to the rear of the machine.
5. Disconnect the long redrive belt [**A**] and slip it off the lower shaft.
6. **3116-002:** Disconnect the output bin sensor cable.
7. Remove the redrive assembly screws [**D**].
8. Remove the plenum assembly and screws [**B**].
9. Unplug the fan cable. The fan [**C**] can now be removed from the plenum assembly.



Fuser Removal

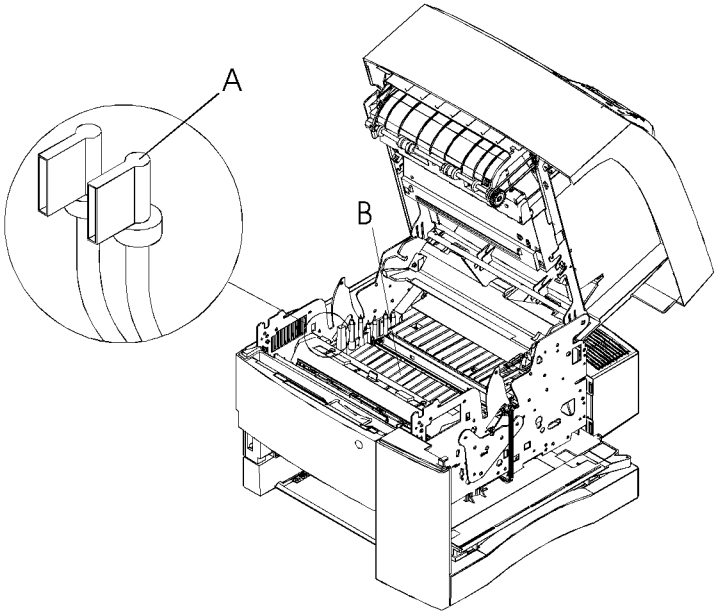
Note: The heater lamp is fragile and may be damaged if you are not careful when you remove or replace the fuser unit.

CAUTION: THE TEMPERATURE OF THE HOT ROLLER IS 150˚-230˚ C (302˚- 446˚F). USE EXTREME CAUTION WHEN REMOVING THIS UNIT. BEFORE YOU SERVICE THIS UNIT, ALLOW THE MACHINE TO COOL FOR 5 MINUTES.

1. Unplug the power cord.
2. Remove the printer cartridge.
3. Through the opening for the paper output, flip the metal ESD shield up out of the way, and disconnect the exit sensor cable from the fuser.
4. Remove the fuser cover.
5. Disconnect the power wires [**A**] from the left side of the fuser.
6. Remove the fuser input guide.
7. Completely loosen the four fuser mounting screws.
8. Lift the fuser out of the machine.

Fuser Input Guide Removal

1. Remove the fuser input guide [**B**] by lifting the rear end of the guide and unsnapping both sides from the fuser.
2. Lift the fuser input guide upward at both sides near the fuser and slide the guide toward the rear of the machine to release.
3. Lift the guide out of the machine.
4. Clean the fuser input guide before installing it.



Fuser Lamp Removal

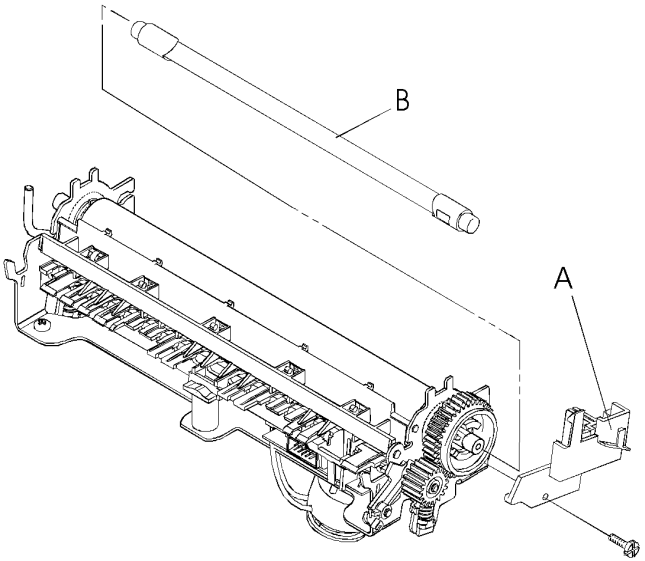
CAUTION: THE TEMPERATURE OF THE HOT ROLLER IS 150-230˚ C (302-446˚F). USE EXTREME CAUTION WHEN REMOVING THIS UNIT. BEFORE YOU SERVICE THIS UNIT, ALLOW THE MACHINE

TO COOL FOR 5 MINUTES.

Note: The fuser lamp is a glass heater. Do not touch the lamp with your hands; skin oils and acids can reduce the life of the heater lamp. Use a soft cloth to handle the heater lamp at all times if the lamp is to be reinserted.

1. Remove the fuser.
2. Remove the right lamp bracket [**A**].
3. Carefully pull the lamp [**B**] out to the right, using a soft cloth if the lamp is to be reinserted.

   Install the new lamp with the color-coded end away from the gear.

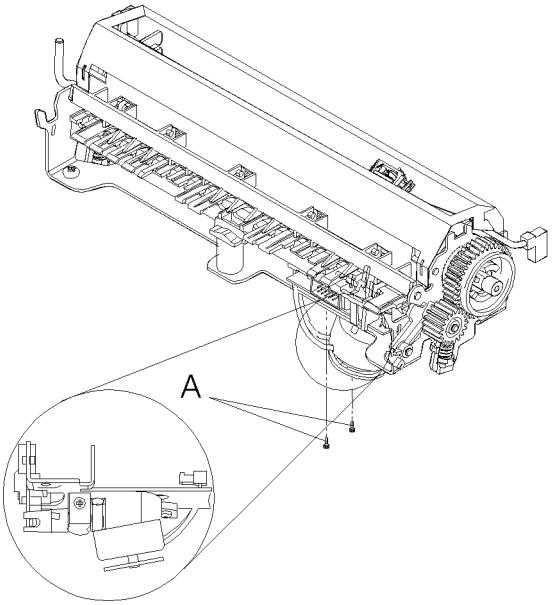


Fuser Solenoid Removal

1. Remove the fuser.
2. Remove the two mounting screws [**A**] holding the solenoid housing to the fuser housing.

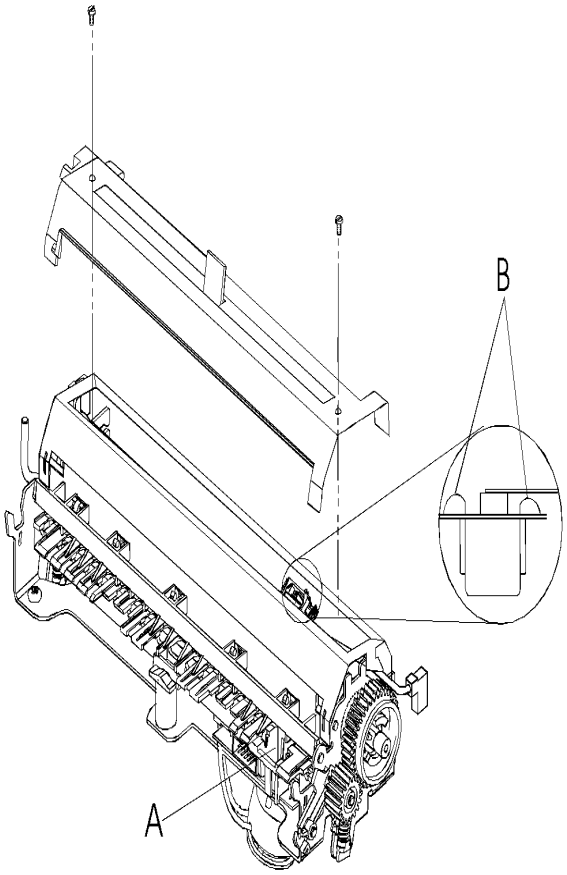
3. Disengage the solenoid bracket from the plunger.

Note: When a new solenoid assembly is installed, the fuser solenoid must be adjusted.



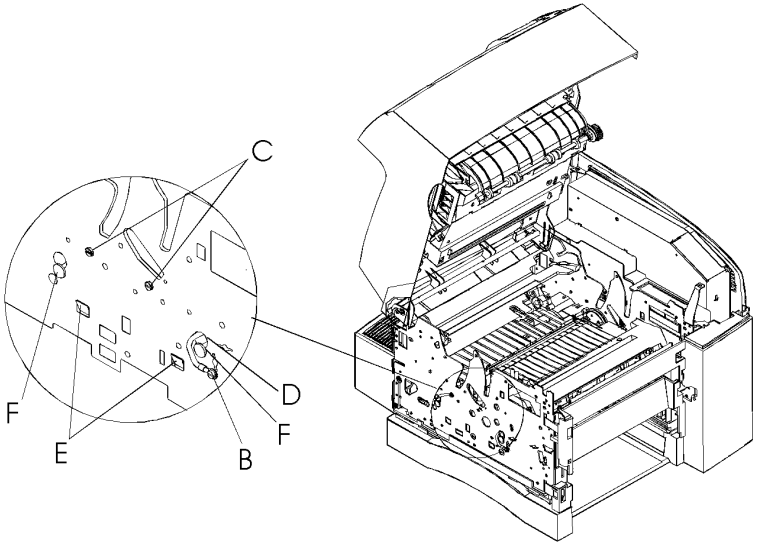
Fuser Thermistor Removal

1. Disconnect the thermistor cable connector [**A**] from the exit sensor card.
2. Remove the fuser cover and wiper.
3. Remove the tape holding the thermistor cable to the shroud.
4. Squeeze the thermistor bracket tabs [**B**] and remove the thermistor from the shroud.
5. Remove the thermistor cable from the guide clips on the right of the fuser to remove the thermistor.


B
A

HVPS Removal

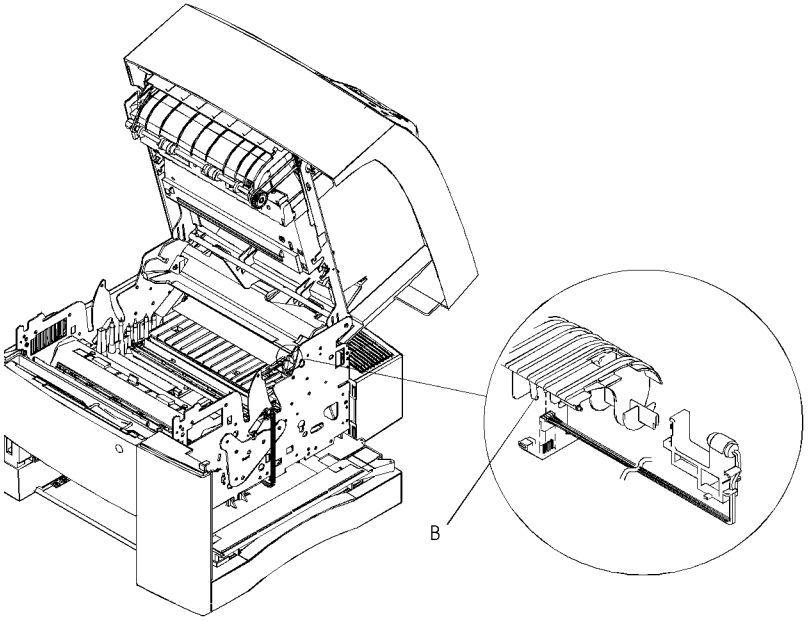
1. Unplug the power cord.
2. Remove the left cover
3. Remove the fuser input guide.
4. Remove the transfer roll housing.
5. Remove the fuser cover.
6. Disconnect the cable from the HVPS connector.
7. Remove the power switch rod.
8. Remove the ground screw [**B**].
9. Remove the mounting screws [**C**].
10. Pull the ground strap through the hole [**D**].
11. The power supply is held in place by two latches on the left side. To release the latches:
    - Push one latch [**E**] in and raise one of the studs [**F**] to release the latch.
    - Push the other latch [**E**] in and raise the other stud [**F**] to release the latch.
12. Lift the power supply until the studs [**F**] align with the large openings, then move the power supply to the right to release it from the frame.
13. Move the front of the power supply to the right (to clear the fuser power wires).
14. Tilt the front of the power supply up and lift it out of the machine.


C
F
E
B
F
D

Input Sensor Board Removal

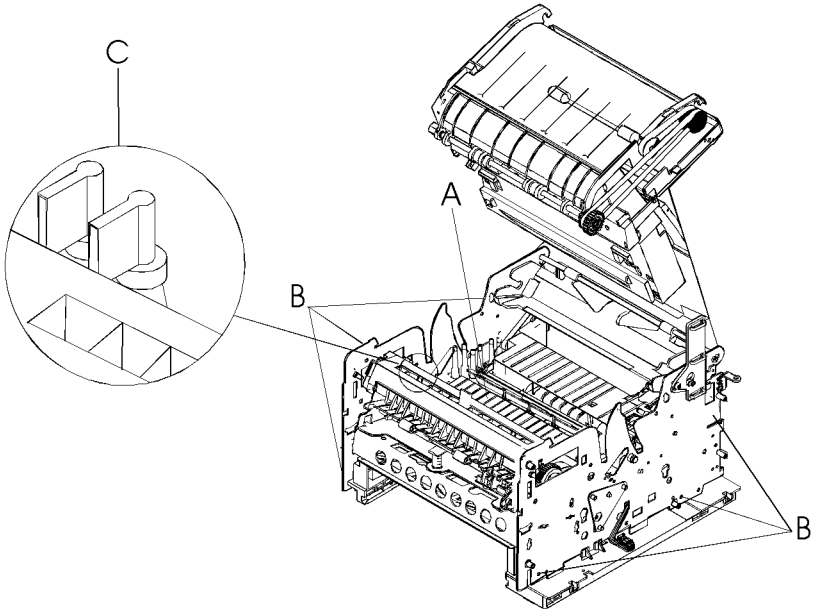
1. Remove the fuser input guide.
2. Remove the transfer roll housing.
3. Remove the D-roll.
4. Disconnect the input sensor cable from the input sensor board.

   Note: Use care, the flag can be damaged while removing the board.
5. Release latch [**B**] and pull the board down and forward to get it out of its mounting.
6. Disconnect the toner sensor cable from the board.
7. Remove the sensor board.


B

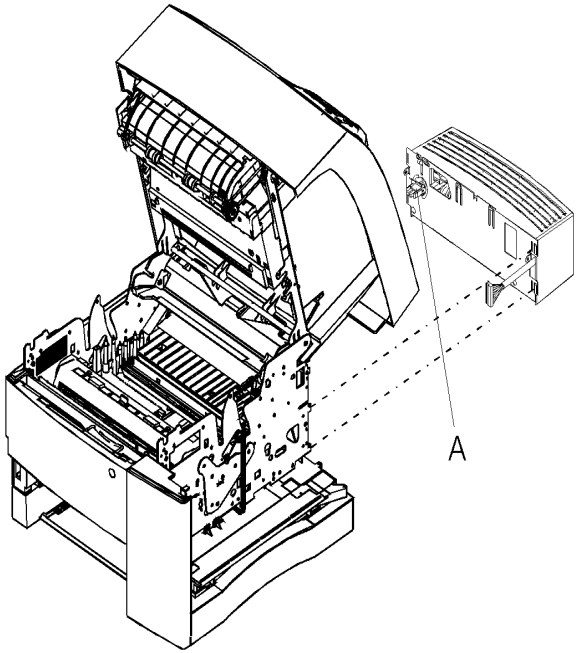
Lower Frame Assembly Removal

1. Remove the right, front, and left covers
2. Remove the LVPS and the rod for the on/off switch.
3. Remove gear cover and the fuser input guide [**A**].
4. Remove the transfer roll housing.
5. Disconnect the cable from the HVPS.
6. Remove the RIP board and the inner EMC shield together.
7. Remove the engine board.
8. Disengage the upper frame cables from the guide in the paper feed side frame.
9. Remove the screws [**B**].
10. Remove the fuser cover.
11. Unplug the fuser wires [**C**] and push them below the HVPS.
12. Unplug the paper size switch cable.
13. Lift the lower frame assembly straight up to separate it from the paper feed assembly.


C
A
B
B

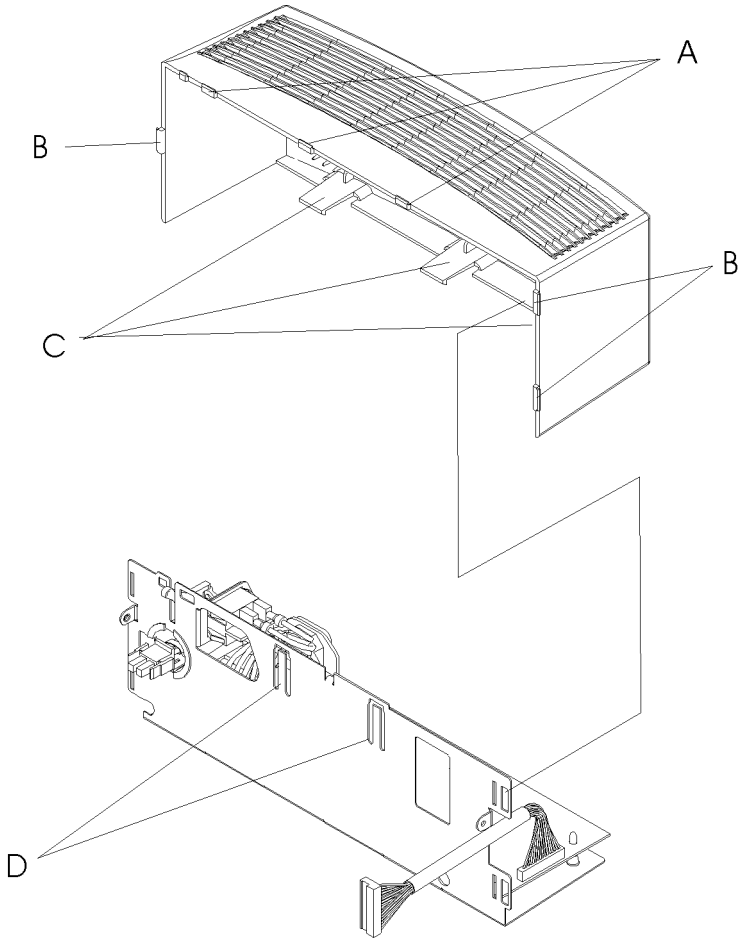
LVPS Removal

1. Disconnect the power cord.
2. Remove all external feed trays.
3. Remove the left and right side covers.
4. Remove the RIP board and the inner EMC shield together.
5. Remove the left and right LVPS mounting screws and the screw for the cable tie.
6. Disconnect the LVPS cable from the engine board.
7. Disconnect the LVPS connector [**A**].
8. Lift the supply up and then toward the right side frame to disconnect the On/Off switch linkage.



LVPS Cover Removal

1. Form tabs [**D**] away from the power supply to create clearance for tabs [**A**] to move downward.
2. Release the top latches [**A**].
3. Release the side latches [**B**].
4. Release the bottom latches [**C**].



Operator Panel Removal

1. Remove the top cover.
2. Disconnect the operator panel cable.
3. Remove the operator panel mounting screws from the inside of the top cover.

INA or Hard Disk Removal

1. Open the top cover.
2. Open the right cover.
3. Remove mounting screws as required.
4. Pop the card off the plastic standoffs.

Host Attachment Card / IPDS Card Removal

Warning: First read “Handling ESD-Sensitive Parts” on page 55.

These procedures can be used for all 311x, but some will not have the IPDS Card.

1. **If the printer POSTs ok, print the menu printouts which describe the customer configuration. This will allow you to restore any settings that are lost when you replace electronics.**

   MENUS
   TEST MENU
   PRINT MENUS

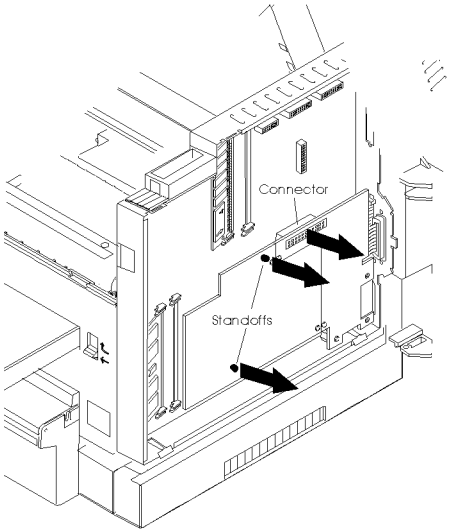
   MENUS
   NETWORK MENU1
   TEST MENU
   PRINT MENUS
   READY

2. Explain to the customer that if he received “code patches”, they may not be included on the new card.

   Note: The host attachment card has a code patch if a “ ***** “ appears in the code level on the first page of the Host print test. The IPDS card has a code patch if a “ ***** “ appears in the code level on the second page. (A higher level of code without a “ ***** “ probably incorporates the code patch.)

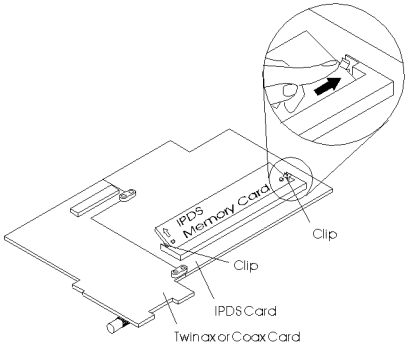
3. Disconnect the host attachment cable (Twinax or Coax) from the Host Attachment Card. Remove all external trays.

4. Open the top cover. Then open the right side cover.
5. Remove the Host Attachment Card grounding screw.
6. With host attachment card, but no IPDS card, unplug the connector. With IPDS, pop the cards off the plastic standoffs as you unplug the connector. (You will need to pinch the standoffs.)



7. With IPDS, separate the Host Attachment Card and the IPDS Card (Remove the 2 screws from the host attachment card.) **Each card is a separate FRU**.
8. Transfer the IPDS memory to the new IPDS card.

Host Attachment Card / IPDS Card Replacement



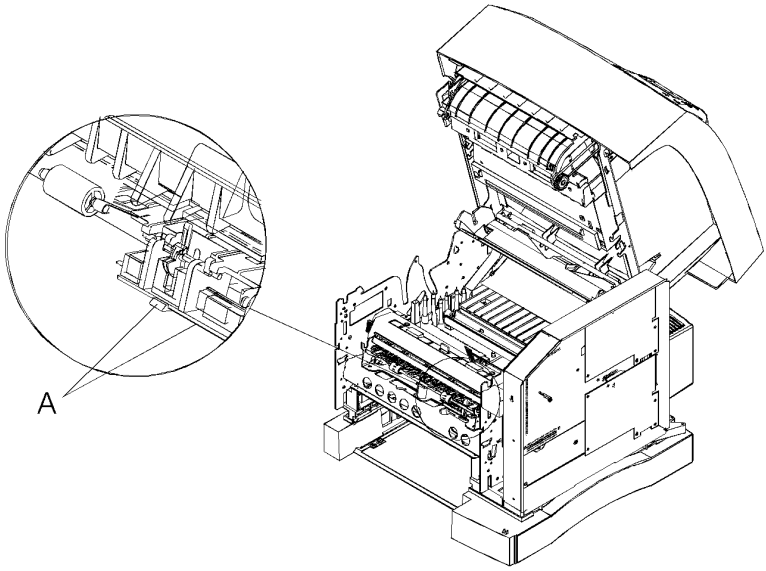
Note: The following directions also apply when you are installing a new IPDS card.

1. With IPDS, attach the Host Attachment Card to the IPDS Card (2 screws).
2. Connect the Host Attachment Card onto the system board. With IPDS, snap the IPDS Card onto the standoffs. **Ensure that the connector is seated**.
3. Install the grounding screw/washer.
4. Close the right side cover and the top cover.
5. Connect the host attachment cable (Twinax or Coax).
6. Use the printouts to return all host settings and non-host settings to the original customer values.

   Note: To avoid losing Host settings at power off, ensure that you select “Save Settings”, within the SAVE/RESTORE menu in Network Menu 1.

Exit Sensor Board Removal

1. Remove the front cover.
2. Disconnect the fuser/sensor cable.
3. Disconnect the thermistor cable.
4. Disconnect the fuser solenoid cable.
5. Release the latches [**A**].
6. Pull the sensor board down to remove it.


A

Paper Feed Magnet Assembly

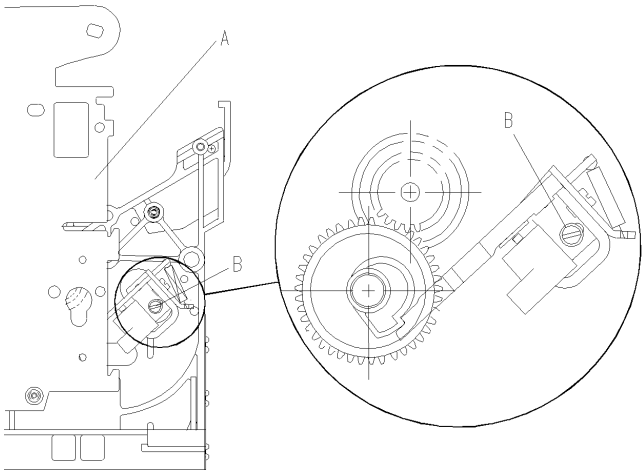
Paper Feed Magnet Assembly Removal

1. Remove the print cartridge.
2. Remove the right cover. (See “Covers” on page 62).
3. Remove the RIP board. (See “RIP Board, Inner EMC Shield, and Engine Board Removal” on page 91).
4. Remove the inner EMC shield.

   Warning: Be careful not to damage the system cable.

5. Locate the paper feed magnet mounting screw (visible through the right side frame **[A]**).
6. Remove the mounting screw **[B]**.
7. Remove the paper feed magnet assembly from the rear (slip the connector under the right frame).

To replace the paper feed magnet assembly, perform the removal procedure in reverse order.

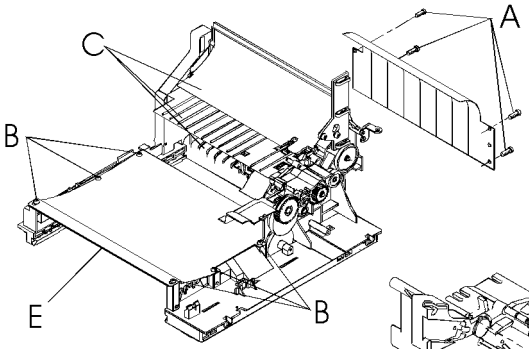


Paper Feed Rollers Removal

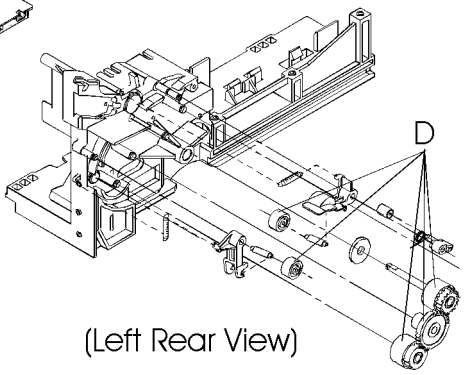
NOTE: Replace all paper feed drive rollers at the same time.

1. Remove the lower frame.
2. Disconnect the cable from the input sensor.
3. Remove the screws [**A**] and the outer deflector.
4. Remove the screws [**B**] and the toner shield [**E**].

5. Separate the side frames.
6. Pull the guides [**C**] out of the side frames.
7. Use a flat-blade tool to snap the gears and rollers [**D**] off the shaft.



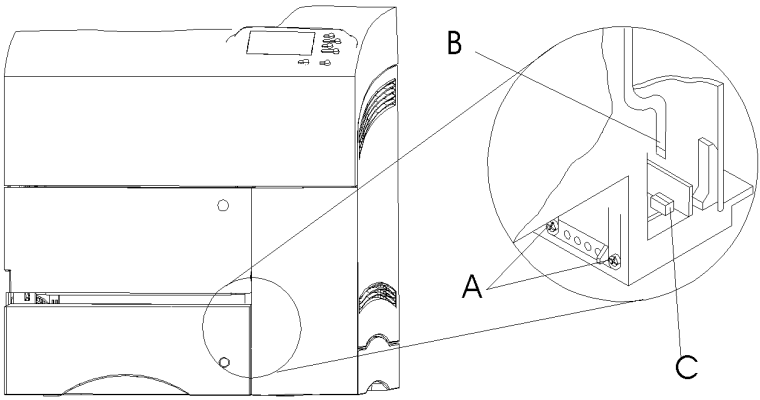
(Right Front View)



(Left Rear View)

Paper Size Switch Removal

1. Remove the paper tray.
2. Remove the front cover.
3. Unplug the cable [**B**] from the switch connector [**C**].
4. Remove the two screws [**A**].
5. Rotate the switch about 90˚and pull it out of the printer.

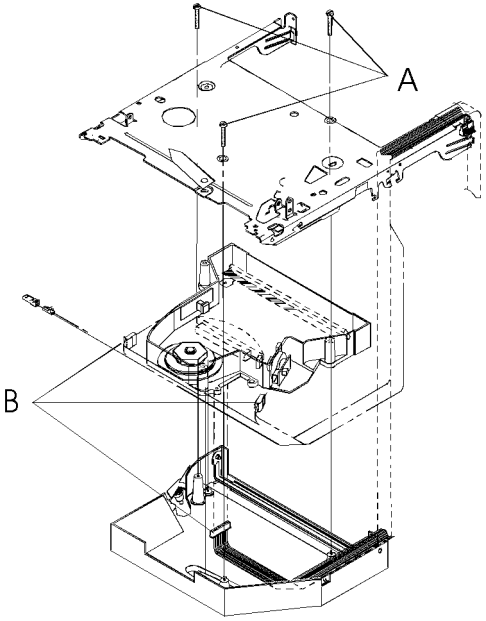


Printhead Removal

IMPORTANT: The Printhead is ESD-sensitive. It is not serviceable and should be replaced as a unit.

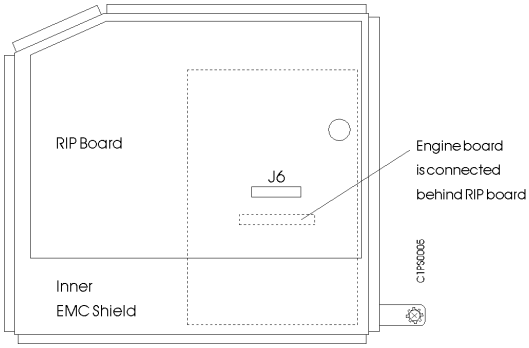
1. Turn the printer off.
2. Remove the print cartridge.
3. Remove the right and top covers.
4. Remove the exit redrive and its belt.
5. Remove the air plenum.
6. Remove the screws [**A**] and the pointer.
7. Cut and discard the Printhead cable clamp.
8. Disconnect the connectors [**B**].
9. Remove the Printhead and the Printhead shroud.
10. Pry off the grip rings holding the Printhead to the shroud.

Note: After replacing the Printhead perform the Printhead skew adjustment.

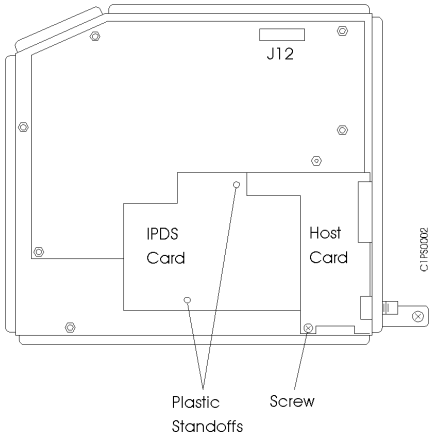

A
B

RIP Board, Inner EMC Shield, and Engine Board Removal

Note: Note: The RIP Board and Inner EMC shield MUST be removed together. This prevents damage to the Engine Board pins.

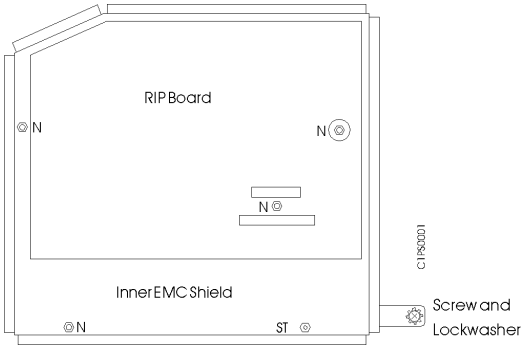


1. Turn the printer off.
2. Remove the right cover (1 E-Clip from the rear pivot pin).
3. Disconnect all the cables near the RIP board (coax, twinax, serial, parallel, LAN, feeder).
4. Remove the Host Card (and the attached IPDS card, if present) from J6.



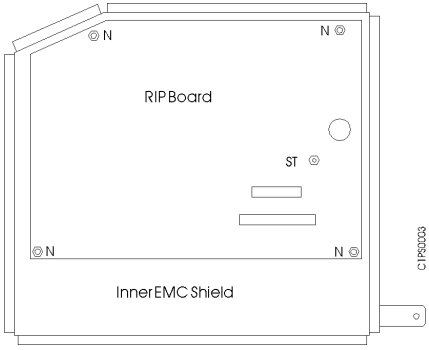
Remove the INA card or hard disk option (if present) from the upper connector (J12).

5. Remove the 4 nuts (N), 1 standoff(ST), and the screw/lock washer.



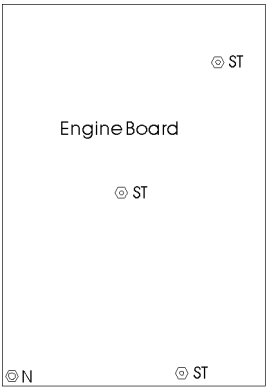
Note: Note: In the following step, the Engine Board to RIP board connector will be damaged if the assembly is not pulled straight out of the printer.

6. Remove the inner EMC shield and RIP board straight out from the printer as an assembly. (You need to pull hard, but carefully)
7. If the RIP board is being replaced, remove the ROM SIMM and all options for installation on the new board.
8. Remove the 4 nuts (N) and the standoff (ST) to separate the RIP board from the inner EMC shield.



9. If you are here to remove the Engine board:
   - Disconnect the engine cable connections.
   - Remove the nut and the three threaded standoffs (the longer standoff is in the center).

- Unsnap the board from the plastic standoff.



Fuser/Sensor Cable Removal

1. Turn the printer off.
2. Remove the RIP board and the inner EMC shield together.
3. Disconnect the cable from the exit sensor board.
4. Remove the front cover.
5. Disconnect the cable from the paper sensor assembly.
6. Remove the cable through the right frame.

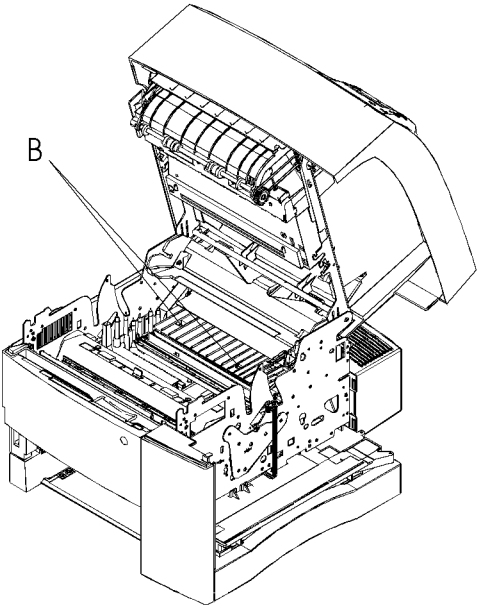
Toner Sensor Removal

1. Remove the fuser input guide.
2. Remove the transfer roll housing.
3. Lift the input sensor board far enough to disconnect the cable.
4. Remove the end of the bellcrank spring.
5. Lift the sensor to unsnap it.
6. Work the cable out of the frame and remove the sensor.

Transfer Roll Housing Removal

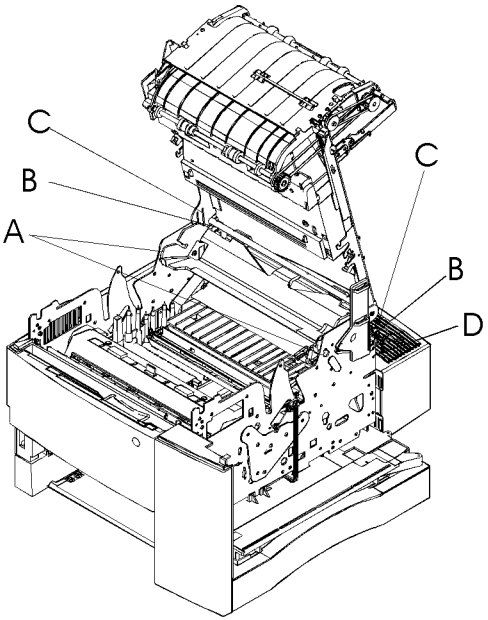
1. Remove the print cartridge.
2. Remove the fuser input guide.
3. Grasp the housing and pull toward the front of the machine to disconnect the housing from the mounting studs, visible through openings [**B**] in the inner deflector.

4. Lift the transfer roll housing far enough to disconnect the erase lamp cable.
5. Lift the transfer roll housing out of the machine.



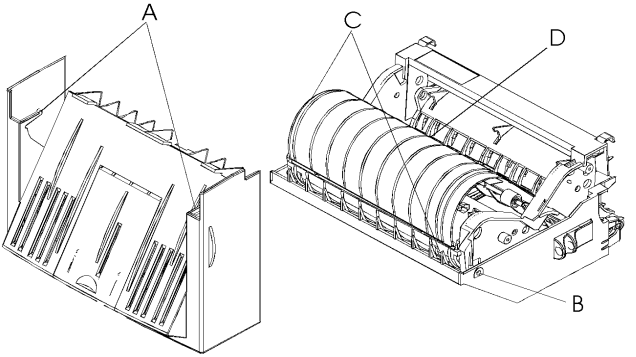
Upper Frame Removal

1. Unplug the power cord.
2. Remove the print cartridge.
3. Remove the right, left, and top covers.
4. Remove the RIP board and the inner EMC shield together.
5. Remove the engine board.
6. Remove the load box latches [**A**].
7. Release the latches [**B**].
8. Pivot the upper frame to the rear to release the spring tension.
9. Unsnap the plastic insert [**D**] holding the upper frame cables in the right side frame.
10. Remove the screws [**C**].
11. Remove the upper frame cables through the side frame.
12. Lift the upper frame off the machine.


C
B
A
C
B
D

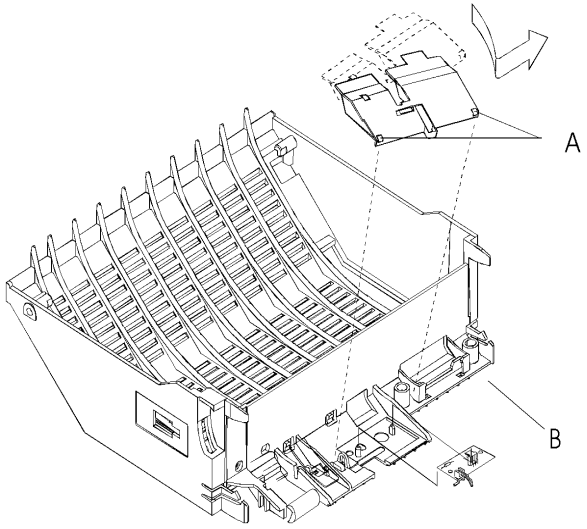
Duplex Option Top Cover And Table Cover Removal

1. Open the top cover by pulling up at [**A**] and pivoting 90˚.
2. Pry the top cover from the bottom cover at [**B**].
3. Release latches [**C**] on the table cover and lift up.
4. Release latch [**D**] and lift the table cover out of the front assembly.



Duplex Option Exit Card And Cover Removal

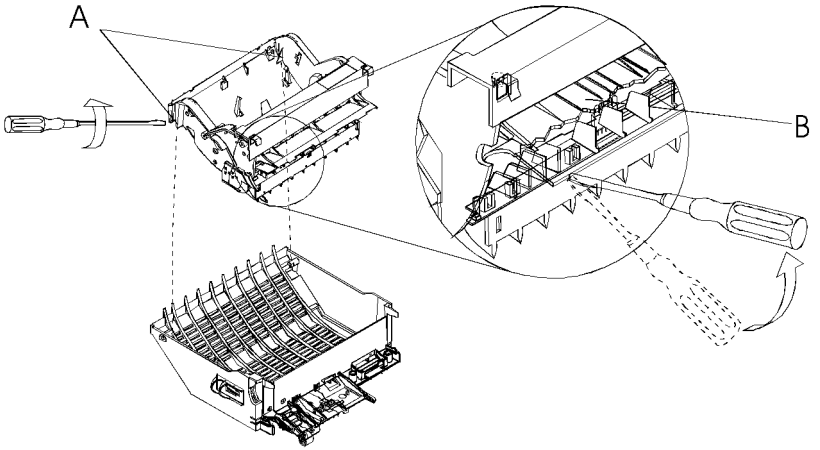
1. Pry up on tabs [**A**]. After the tabs are released, lift up on the cover, rotate the cover out, and slide it to the right to completely remove it.
2. Disconnect the exit sensor card cables.
3. Depress the exit sensor flag actuator [**B**] and lift out the exit sensor card.



Duplex Option Bottom Cover And Entry Sensor Card Removal

1. Remove the duplexer top cover.
2. Remove the exit card cover and exit card.
3. Pry off the cover for the blind connector.
4. Pry up on the blind connector to remove it from the bottom cover.
5. Release the two latches [**A**] on the frame assembly and lift it out of the bottom cover.

Note: When re-installing the sensor lift up the flags so they will clear the sensor and not be damaged.

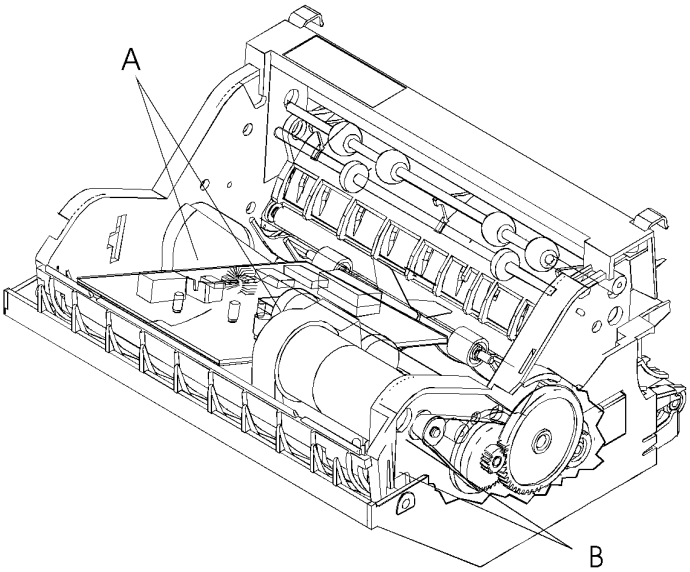

A
B

Duplex Option System Card And Motor Removal

1. Disconnect all cables.
2. Release latches [**A**] and lift the system board out.
3. Remove the two motor mounting screws [**B**].
4. Lift the motor out of the frame assembly.

Note: Reinstall the motor so the belt is not tight but will not jump teeth on the timing pulley.

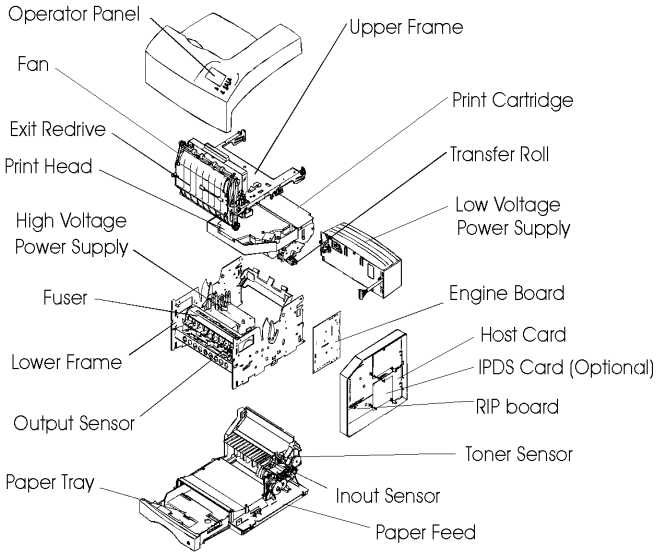
Note: The remaining FRU is the Gear block Assembly. When you replace this FRU *see* “Lubrication Specifications” on page 115.



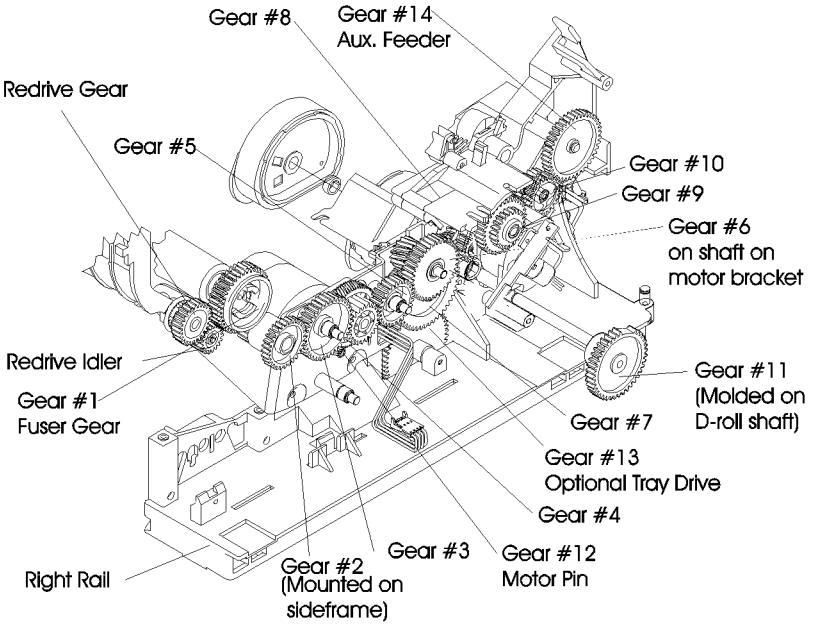
Connector Locations

This chapter shows the locations of major printer assemblies, gears, connectors, and ground straps.

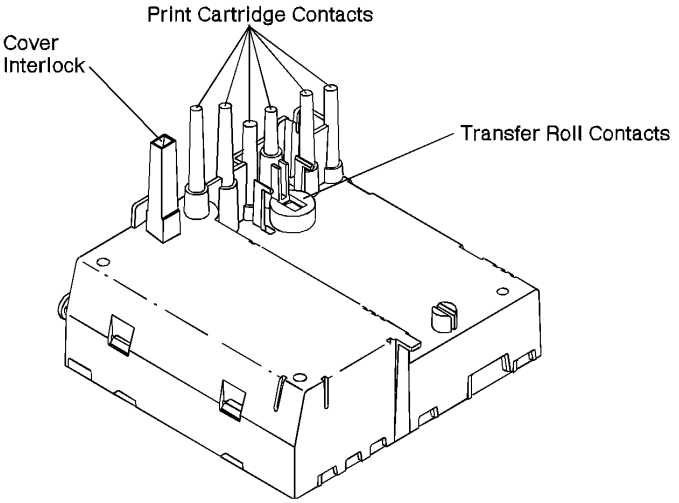
Major Assembly Locations



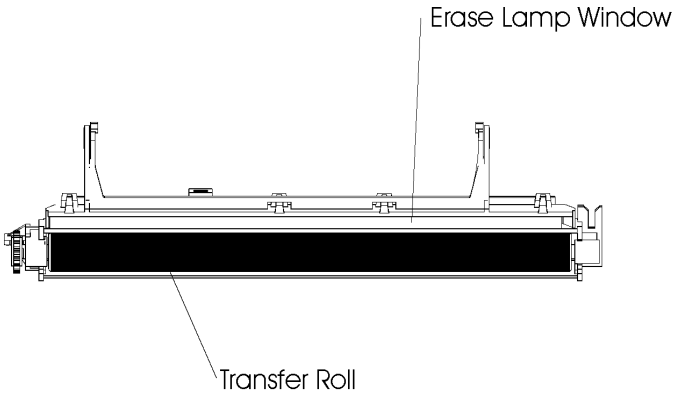
Gear Train


Gear #8
Gear #14
Aux. Feeder
Redrive Gear
Gear #5
Gear #10
Gear #9
Gear #6
on shaft on
motor bracket
Redrive Idler
Gear #1
Fuser Gear
Gear #11
(Molded on
D-roll shaft)
Gear #7
Gear #13
Optional Tray Drive
Gear #4
Gear #3
Gear #12
Motor Pin
Right Rail
Gear #2
(Mounted on
sideframe)

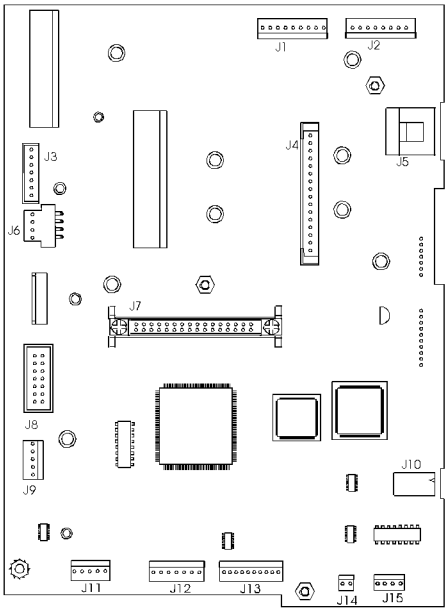
HVPS



Transfer Roller Housing

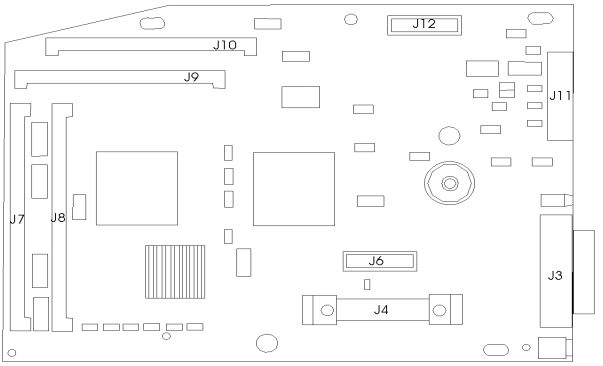


Engine Board Connectors



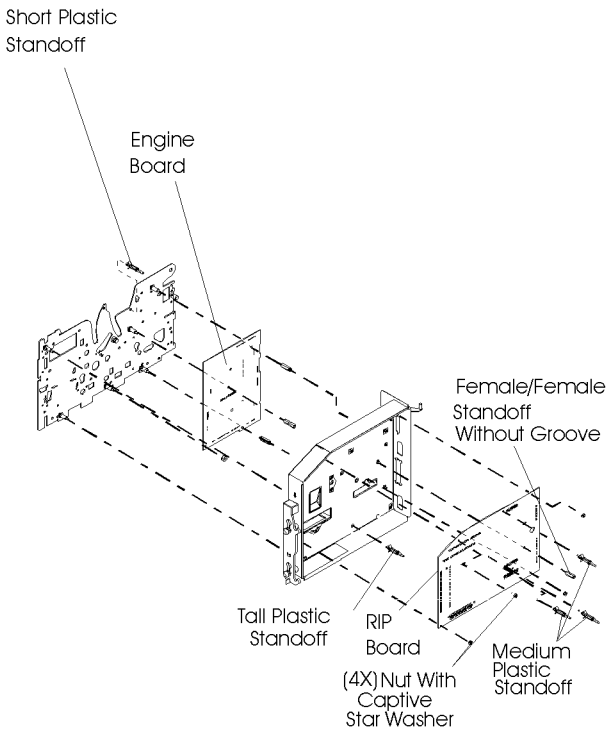
Engine Board Connectors	
Connector	**Name**
J1	Operator Panel/Output Bin Sensor
J2	Printhead Mirror Motor/Fan
J3	Duplex
J4	LVPS
J5	Reserved
J6	Paper Drive Motor
J7	Board-to-Board Connector (Rip Board/Engine Board)
J8	Exit/Paper Size Sensor/Fuser Solenoid
J9	Input/Toner Sensor Board/Erase Lamps
J10	Envelope Feeder Magnet
J11	Printhead Hsync
J12	Printhead Laser
J13	HVPS
J14	Paper Feed Magnet
J15	500 Sheet Feed Option

RIP Board

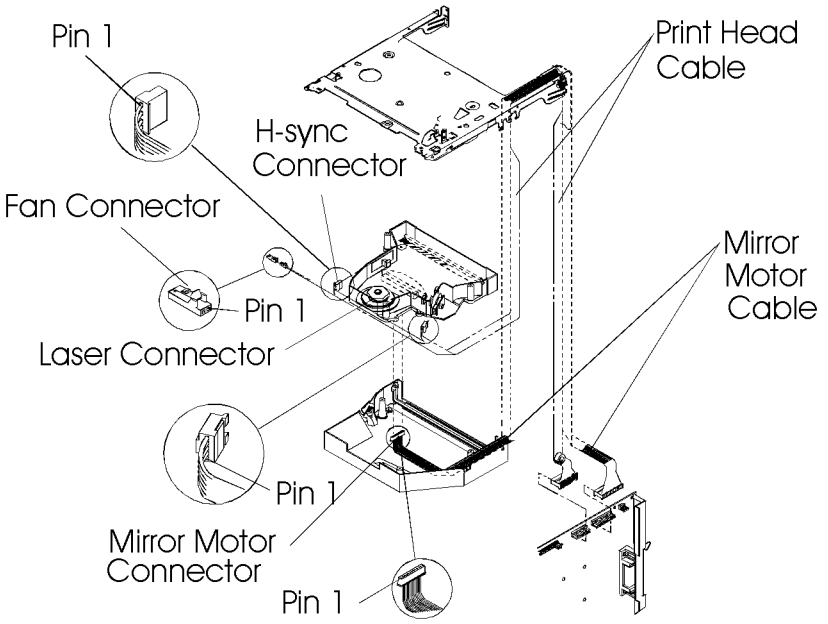


RIP Board Connectors	
Connector	**Name**
J1	Font Card (on back of board)
J2	
J3	Parallel Port
J4	Board-to-Board
J5	
J6	Host (Coax or Twinax) With IPDS option, an IPDS Card is connected to the Host Card.
J7	ROMM SIMM (flash memory option)
J8	ROMM SIMM (printer microcode)
J9	DRAM SIMM (printer memory)
J10	DRAM SIMM (printer memory)
J11	Serial Port
J12 (Optional)	INA/hard disk (internal Network Adapter for LAN printing)

Board Installation Hardware



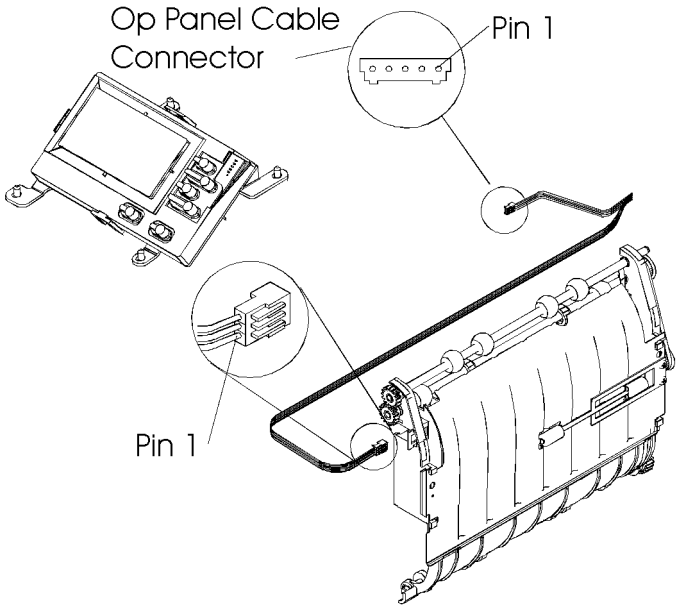
Printhead Connector Locations



Mirror Motor/Fan Cable

Mirror Motor/Fan Cable Connections		
	Motor	**Fan**
J2-1	1	
J2-2	2	
J2-3	3	
J2-4	4	
J2-5	5	
J2-6	6	
J2-7		2
J2-8		1

Operator Panel/Output Bin Sensor Cable



Operator Panel/Output Bin Sensor Cable Connectors		
Pin	**Op Panel**	**Sensor (3116-002, -003) ***
J1-1	1	
J1-2	2	
J1-3	3	
J1-4	4	
J1-5	5	

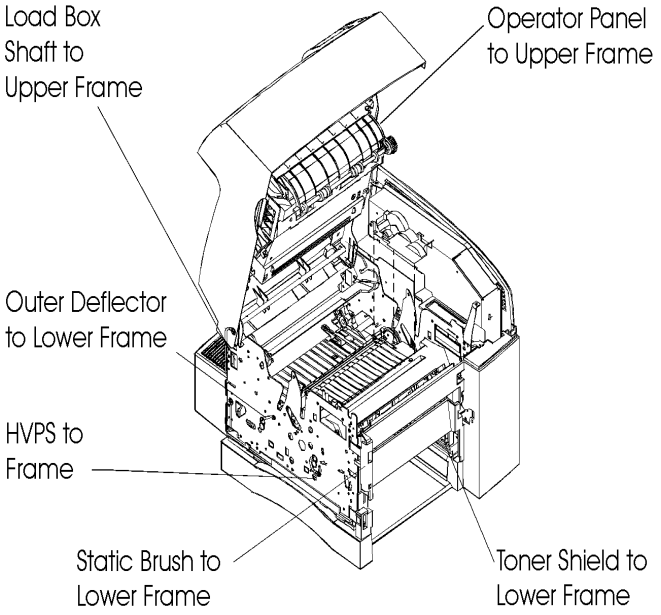
Operator Panel/Output Bin Sensor Cable Connectors		
Pin	**Op Panel**	**Sensor (3116-002, -003) ***
J1-6		1
J1-7		2
J1-8		3
J1-9		No connection

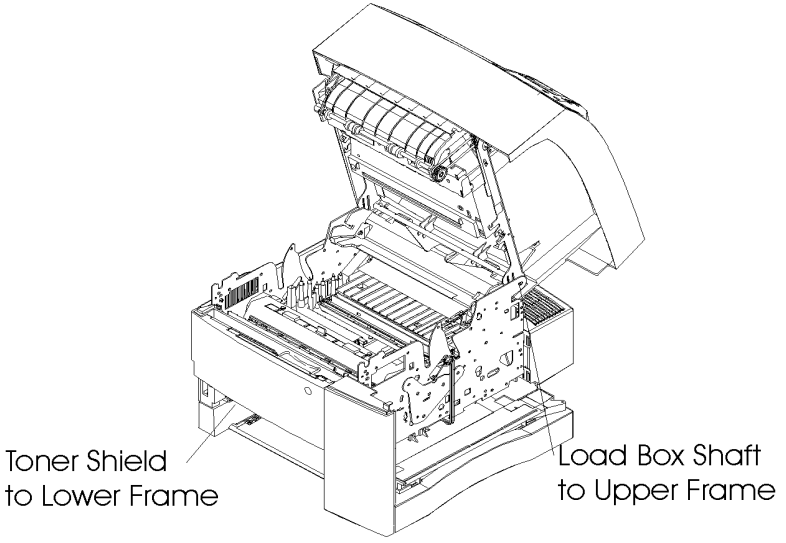
* The same cable is used on the 3312-001 and 3116-001, but the output bin sensor leads are not used.

Duplex Autoconnect Cable

Duplex Autoconnect Cable Connectors	
Engine Board	**Autoconnect**
J3-1	No connection
J3-2	1 (right most pin)
J3-3	2
J3-4	3
J3-5	4
J3-6	5
J3-7	6

Printer Ground Straps





Preventive Maintenance

This chapter describes procedures for printer preventive maintenance. Following these recommendations can help prevent problems and maintain optimum performance.

Safety Inspection Guide

The purpose of this inspection guide is to aid you in identifying unsafe conditions.

Use good judgment to identify possible safety conditions not covered by this inspection guide. Refer to the safety reminders for a general checklist.

If any unsafe conditions exist, find out how serious the hazard could be and if you can continue before you correct the hazard.

Check the following items:

- Damaged, missing, or altered parts, especially in the area of the On/Off switch and the power supply
- Damaged, missing, or altered covers, especially in the area of the top cover and the power supply cover
- Possible safety exposure from any non-Lexmark attachments

Lubrication Specifications

Lubricate only when parts are replaced or as needed, not on a scheduled basis. Use of lubricants other than those specified can cause premature failure. Some unauthorized lubricants may chemically attack polycarbonate parts. Use IBM no. 10 oil, p/n 1280443 (Approved equivalents: Mobil DTE27, Shell Tellus 100, Fuchs Renolin MR30) to lubricate the areas of contact between:

- Gear no. 2 and its stud on the side plate
- Gear no. 3 and its stud on the motor bracket
- Gear no. 4 and its thrust washer
- Gear no. 4 and its stud on the motor bracket
- Gear no. 5 and its stud on the motor bracket

- Gear no. 6 and its stud on the motor bracket
- Gear no. 6 and its thrust washer
- Gear no. 7 and its stud on the rail
- Gear no. 7 and its thrust washer
- Gear no. 8 and its stud on the rail
- Gear no. 8 and its thrust washer
- Gear no. 9 and its stud on the rail
- The metering roller shaft and its bushings on the rail assembly
- The main metering backup roller and its stud and thrust washer
- The D-roller shaft and its bushings on the rail assembly
- The auxiliary metering roller and its stud on the rail, including the snap-in groove and the snap ridges in the roller hole
- Gear no. 14 and its stud on the rail
- Gear no. 13 and its stud on the rail
- The auxiliary paper feed idler and its stud on the rail
- The prealigner drive idler and its stud on the rail
- The prealigner drive roller and its stud on the rail
- The prealigner backup roller and its shaft and thrust washer
- The fixed-center idler gear in the 500 sheet base and its shaft
- The idler gear in the 500 sheet base and its shaft

Use IBM no. 23 grease (Approved equivalent Shell Darina 1) to lubricate:

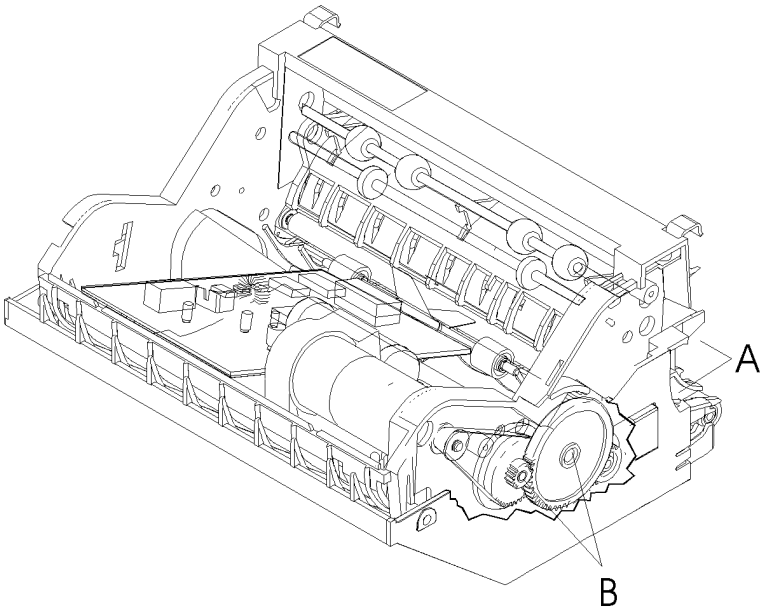
- Front pivot latch studs
- Gear no. 8 teeth at gear no. 7 contact points
- Gear no. 9 teeth at gear no. 11 contact points
- Gear no. 9 teeth at gear no. 8 and gear no. 10 contact points
- Cover Hinge Spring tips
- Cartridge “ramps” at top center of both sides frames
- Latch handle tips
- Area of contact between fuser release bail and roll
- All release arms areas of contact of fuser solenoid lever.

Use grease, p/n 1329301 to lubricate gear nos. 2,3,4,5,6, and 12. Use all the grease in the packet. Apply part of the grease, rotate the gears, and apply the rest. The teeth of gears 3, 4, and 5 should be completely coated.

Use grease, p/n 1384076 to lubricate:

- [**A**] Areas of contact between the two shafts and the grounding spring.

Use grease, p/n 1383586 to lubricate: [**B**] on the duplex unit.

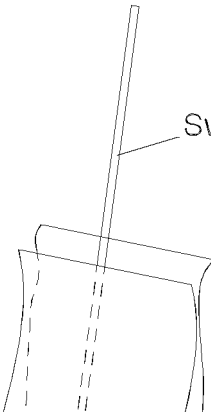


Printhead Window Cleaning Procedure

Do not use cleaning fluids on the printhead window. Do not use a bare cotton swab. The swab deposits lint on the window.

Note: The printhead window is a coated glass. Do not push too hard and scratch or break the glass.

1. Remove the print cartridge.
2. Fold a lint free cloth over a cotton swab.



3. Open the shutter.
4. Insert the swab and cloth combination in the printhead window slot, then slide it left to right several times. Move the swab to a clean spot on the cloth and repeat the cleaning procedure. Do this procedure several times to make sure the window is clean.

Cleaning The Transfer Roller

Power off the printer. Power on and let it complete POST. Do this two to three times.

Usage Kit Information

The printer automatically displays the **80 Scheduled Maintenance** message after each 200K impressions. Press **CONTINUE** to keep printing.

Customers will need to purchase a Usage Kit. It contains new mechanical parts to replace your worn ones. The cost of the kit includes the cost of the installation.

Usage Kit Part Numbers		
Voltage	**3112**	**3116**
110V (100 to 127V)	IBM part **69G5266**	IBM part **69G5264**
220 V (200 to 240 V)	IBM part **69G5267**	IBM part **69G5265**

Notes:

USA only: The kit part numbers listed above are available to customers by calling toll free 1-800-346-3939.

Canada only: The kits are available to customers in Canada by calling toll free 1-800-465-1234 x 478 and ordering the following:

- 3112 - 62469G5266
- 3116 - 62469G5264
- **Europe only:** Customers have two options for ordering Usage kits:
  - Order as Feature Codes through your IBM Marketing Representative (Feature Code 4920 for 110V; Feature Code 4921 for 220 V).
  - Contact **IBM DIRECT** within the country and order the part number listed above.

Outside these locations, customers contact their point of purchase or Lexmark. Note that kits other than the part numbers listed above will not include installation in the cost.

Parts Catalog

How To Use This Parts Catalog

- SIMILAR ASSEMBLIES: If two assemblies contain a majority of identical parts, they are broken down on the same list. Common parts are shown by one index number. Parts peculiar to one or the other of the assemblies are listed separately and identified by description.
- AR: (As Required) in the Units column indicates that the quantity is not the same for all machines.
- NP: (Non-Procurable) in the Units column indicates that the part is non-procurable and that the individual parts or the next higher assembly should be ordered.
- NR: (Not Recommended) in the Units column indicates that the part is procurable but not recommended for field replacement, and that the next higher assembly should be ordered.
- R: (Restricted) in the Units column indicates that the part has a restricted availability.
- NS: (Not Shown) in the Asm-Index column indicates that the part is procurable but is not pictured in the illustration.
- INDENTURE: The indenture is marked by a series of dots located before the parts description. The indenture indicates the relationship of a part to the next higher assembly. For example:

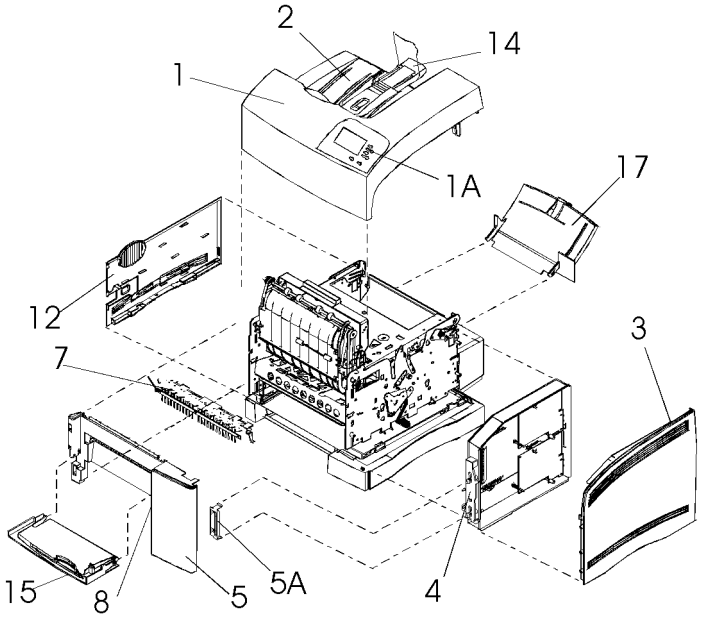
  INDENTURE RELATIONSHIP OF PARTS

  (No dot) MAIN ASSEMBLY

  (One dot) o Detail parts of a main assembly

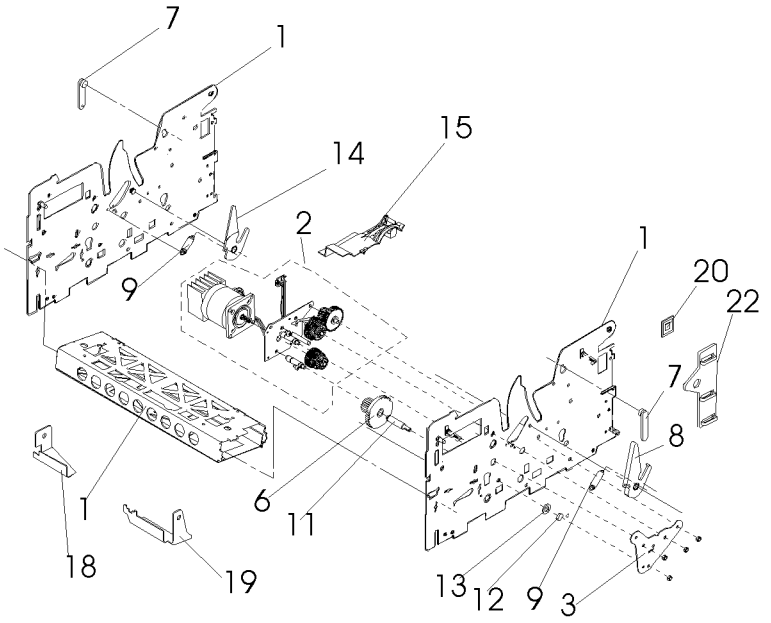
  (One dot) o Subassembly of the main assembly

Assembly 1: Covers



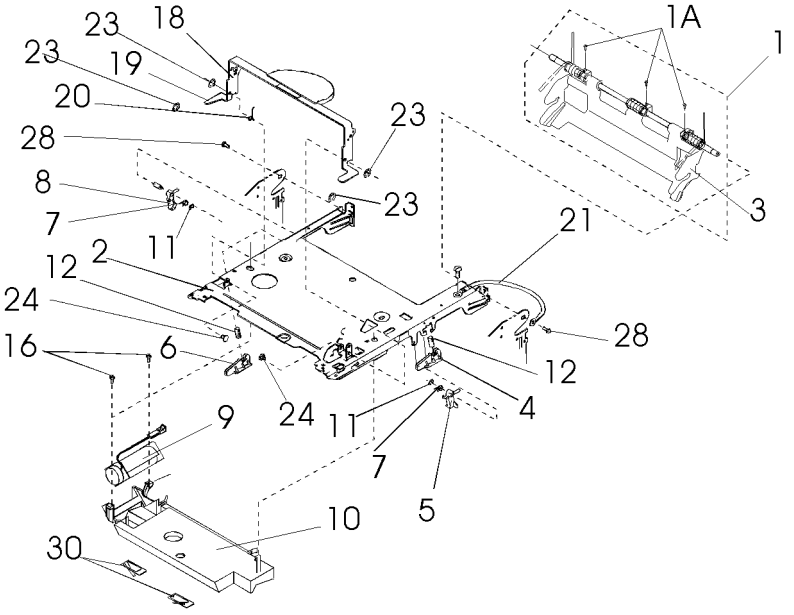
Asm-Index	Part Number	Units	Description
1-1	69G5012	1	Top Cover, 3112-001
-1	69G5212	1	Top Cover, 3116-001
-1	69G5055	1	Top Cover, 3116-002, -003
-1A	1381631	1	Operator Panel Asm
NS		4	Screw, Operator Panel-Parts Packet 1381663
-2	1381656	1	Tray Asm, Stacker, 3112-002, -003
NS		1	Spring, Stacker-Parts Packet 1381666
-3	1408176	1	Right Cover Asm
-4	1408163	1	Latch, Right Cover
NS	1408233	1	Spring, Right Cover Latch
-5	1408184	1	Front Cover Asm, 3112-001, 3116-001
-5	1408384	1	Front Cover Asm, 3116-002, -003
-5A	1425457	1	Bracket, Front Cover Retaining
-7	1329070	1	Output Deflector
-8	1408326	1	Output Deflector Lever
NS		1	Spring, Deflector Lever, Parts Packet 1381666
-12	1408188	1	Left Cover
-14	1381657	1	Paper Stop Asm, 3112-001, 3116-001
-14	1381658	1	Paper Stop Asm, 3116-002, -003
-15	1381659	1	Cover Asm, Front Exit Tray
-17	1408394	1	Manual Feed Tray with guide
NS	1408172	1	Plug, Printhead Adjustment, 3116-001

Assembly 2: Lower Frame



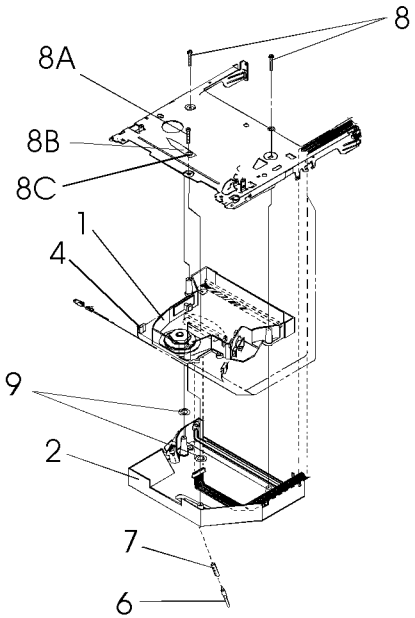
Asm-Index	Part Number	Units	Description
2-1	1381667	1	Lower Frame Assembly
-2	1381632	1	Motor, Brkt. and Gear Asm, 3112-001
-2	1381633	1	Motor, Brkt. and Gear Asm, 3116-001, -002, -003
-3	1408572	1	Plate Asm. Gear Box Mtg.
-4	1408779	1	Clip, Ground, Motor Mtg.
NS		2	Mtg. Screw, Motor Asm-Parts Packet 1381663
NS		4	Mtg. Nut, Gear Asm.-Parts Packet 1381663
-6	1328243	1	Gear No. 2
-7	1039391	2	Detent, Box
-8	1329013	1	Right Cartridge Latch
-9		1	Spring, Parts Packet 1381666
-11	1039271	1	Shaft, Gear 2
-12		1	Nut, Gear 2, Parts Packet 1381663
-13		1	Lockwasher, Gear 2, Parts Packet 1381663
-14	1329144	1	Left Cartridge Latch
-15	1408645	1	Gear Train Cover
-18	1328428	1	LH Bracket, Duplex
-19	1328427	1	RH Bracket, Duplex
NS		1	Screw, Duplex Bracket, Parts Packet 1381663
-20	1039476	1	Grommet, Printhead Cable
-22	1408623	2	Cable Clamp
-23	1408721	1	Guide, Cable
NS		4	Screw, Cable Clamp, Parts Packet 1381663

Assembly 3: Upper Frame



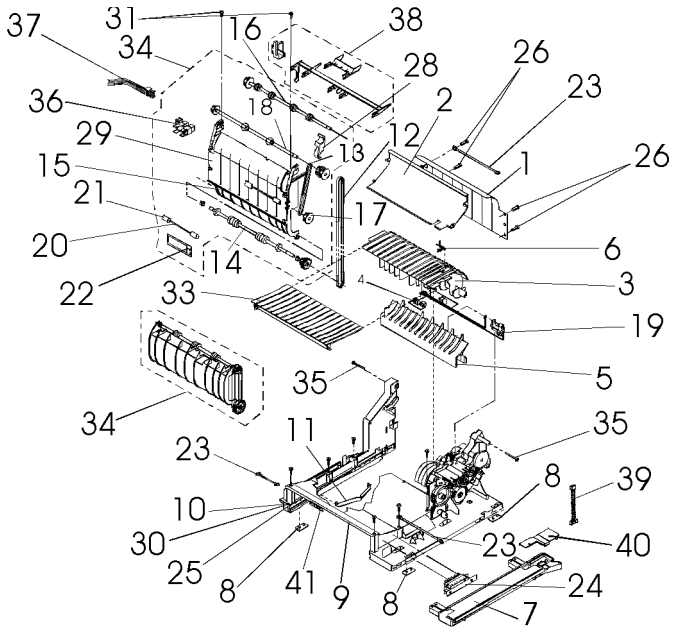
Asm-Index	Part Number	Units	Description
3-1	1325196	1	Cover Hinge Asm 3112-001, 3116-001 (does not include the load box)
-1	1381045	1	Cover Hinge Asm 3116-002, -003 (does not include the load box)
-1A		1	Screw, Cover Hinge Parts Packet 1381663
-2	1325103	1	Upper Plate Asm 3112-001, 3116-001
-2	1328218	1	Upper Plate Asm 3116-002, -003
-3	1427306	1	Cartridge Load Box
-4		1	Right Cam Button, Parts Packet 1381663
-5	1039693	1	Right Bellcrank
-6		1	Left Cam Button, Parts Packet 1381663
-7		1	Spring, Bellcrank, Parts Packet 1381666
-8	1039692	1	Left Bellcrank
-9	1383998	1	Fan Asm
NS	1424481	1	Pad, Acoustic (Fan)
-10	1328222	1	Plenum Asm
-11		1	Retainer, Parts Packet 1381663
-12		1	Spring, Parts Packet 1381666
-16		2	Screw, Plenum Mtg., Parts Packet 1381663
-18	1408616	1	Handle Latch, with Grip, 3112-001, 3116-001
-18	1408216	1	Handle Latch, with Grip, 3112-002, -003
-19	1328308	2	Sleeve
-20		1	Spring, Handle-Parts Packet 1381666
-21		2	Ground Strap, Parts Packet 1381669
-23		1	Retainer, E-Clip, Parts Packet 1381663
-24		1	Pivot, Handle--Parts Packet 1381663
-27		1	Washer, Parts Packet 1381663
-28		2	Screw, Shaft Mtg., Parts Packet 1381663
-30	1328467	1	Spring, Plenum

Assembly 4: Printhead



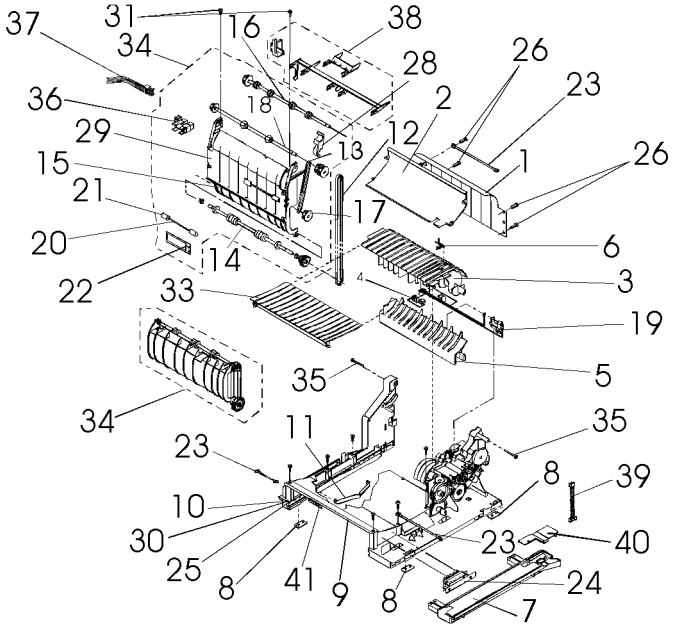
Asm-Index	Part Number	Units	Description
4-1	1381635	1	Printhead
-2	1328431	1	Printhead Shroud Assembly
-3	1408033	1	Cable, Fan/Mirror Motor
-4	1408034	1	Cable, hsync
NS	1038199	1	Cable, Tie
-5	1425284	1	Cable, Laser (Install with marked end to Printhead)
-6		1	Pin, Parts Packet 1381666
-7		1	Spring, Parts Packet 1381666
-8		2	Screw, Printhead Mtg., Parts Packet 1381663
-8A		1	Screw, Hex Headed Parts Packet 1381663
-8B		1	Pointer, Parts Packet 1381663
-8C		1	Clip, Hex Screw Ground, Parts Packet 1381663
-9		2	Retainer, Parts Packet 1381663

Assembly 5: Paper Feed



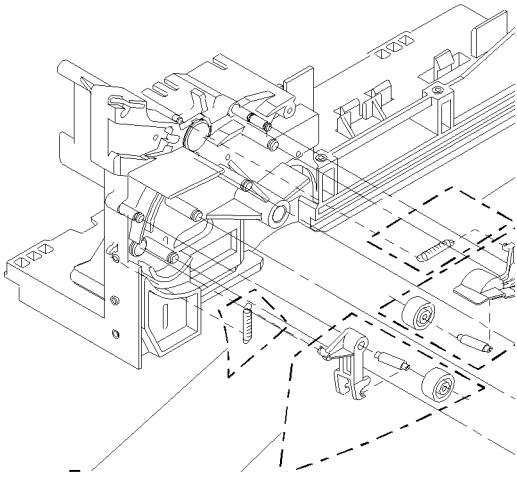
Asm-Index	Part Number	Units	Description
5-1	1039101	1	Outer Deflector
-2	1183597	1	Upper Deflector
-3	1381670	1	Inner Deflector with Roller
-4	1381636	1	Input Sensor Board
-5	1408859	1	Lower Deflector
-6		1	Flag, Input Sensor, Parts Packet 1381669
-7	1408703	1	Right Rail Asm (Without Gears)
-7A	1408249	1	Extension Asm, Right Rail
-8	1039170	4	Machine Pad
-9	1408690	1	Toner Shield
-10	1328317	1	Left Frame
-11	1039175	1	Tray Frame Spring
-12	1042211	1	Belt, Redrive 3112-001, 3116-001
-12	1328192	1	Belt, Redrive, 3116-002, -003
-13	1328193	1	Belt, Auxiliary 3116-002, -003
-14	1328172	1	Shaft Asm, Lower Redrive
-15	1408744	1	Deflector, Redrive, 3112-001, 3116-001
-15	1408804	1	Deflector, Redrive 3116-002, -003
-16	1042206	1	Shaft Asm, Upper Redrive
-17	1328169	1	Shaft Asm, Auxiliary Shaft 3116-002, -003
-18	1042207	1	Shaft Asm, Middle Redrive 3112-001, 3116-001
-18	1328173	1	Shaft Asm, Middle Redrive 3116-002, -003
-19	1381073	1	Toner Sensor
-20	1328323	1	Shaft, 3116-002, -003
-21	1328322	2	Roller, backup 3116-002, -003
-22	1328321	1	Spring, backup 3116-002, -003
-23		2	Jumper, Ground, Parts Packet 1381669
-24	1381015	1	Sensor Asm, Paper Size
-25	1183244	1	Arm, Tray Frame
-26		4	Screw, Deflector Mtg, Parts Packet 1381663
-28	1402325	1	Bearing
NS	1328450	1	Spring, Shaft Grd. 3116-002, -003
NS	1427418	1	Spring, Shaft Grd. 3112-001, 3116-001

Assembly 5: Paper Feed (Continued)



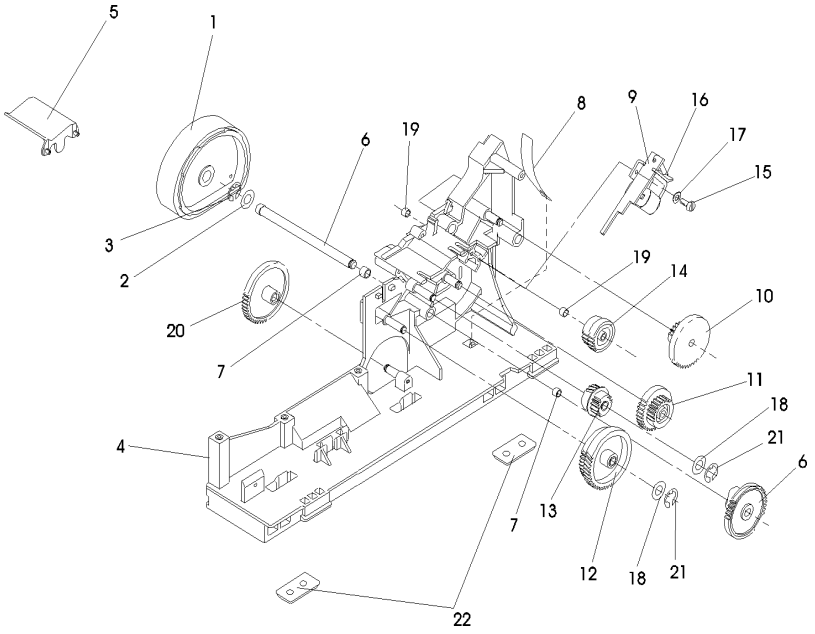
Asm-Index	Part Number	Units	Description
5-29	1408717	1	Outer Redrive Shield
-29	1328381	1	Outer Redrive Shield 3116-002, -003
NS		2	Screw Backup Spring Mtg., Parts Packet 1381663
-30		1	Spring, Arm Tray Bias, Parts Packet 1381666
-31		2	Screw, Redrive Mtg., Parts Packet 1381663
-33	1038186	1	Guide, Fuser Input
-34	1381527	1	Redrive Assembly 3116-002, -003
-34	1408729	1	Redrive Assembly, 3112-001, 3116-001
-35		6	Screw, Frame to Paper Feed, Parts Packet 1381663
NS	1328345	1	Spring, Bias, Transfer Housing
-36	1381298	1	Output Bin Sensor 3116-002, -003
-37	1408064	1	Cable, Output Bin/Op Panel (Output Bin lead has no connection on 3112-001, 3116-001)
-38	1381567	1	Guide, Bail, and Minibail Kit (3112-001, 3116-001 uses Minibail only)
-39	1408061	1	Cable, Tray 2 Blind Mate
-40	1408792	1	Cover, Tray 2 Cable Opening
-41	1408892	1	Cable, Duplex Autoconnect

Assembly 6: Paper Feed Alignment Gears



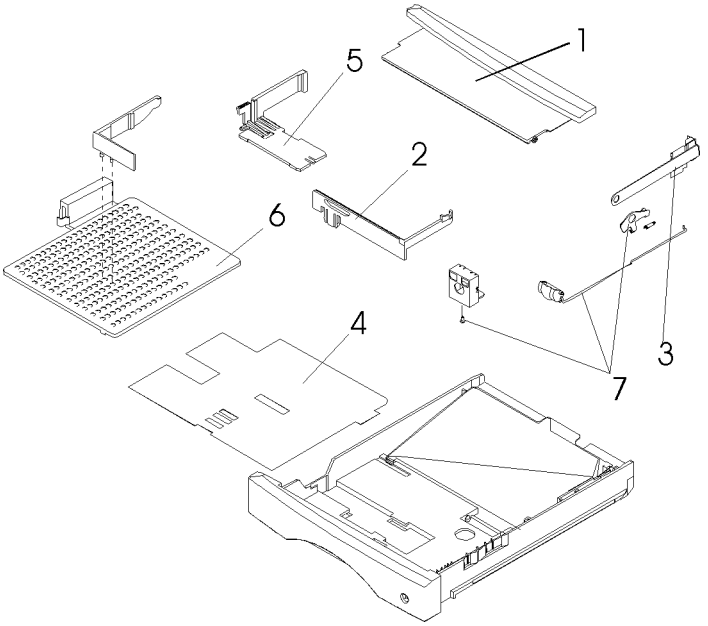
Asm-Index	Part Number	Units	Description
6-1	1427307	1	Bellcrank, Metering
-		1	o Shaft
-		1	o Bellcrank
-		1	o Roll
-		1	o Thrust Washer
-2	1381145	1	Kit, Prealigner and Auxiliary Rollers
-3	1039278	1	Gear, Idler, Prealigner
-4		1	Spring, Prealigner and Metering Bellcranks, Parts Packet 1381666
-5	1328384	1	Bellcrank, Prealigner
-		1	o Shaft
-		1	o Roll
-		1	o Bellcrank
-		1	o Thrust washer
NS	1383580	1	Anchor Repair Kit (Metering)
NS	1383908	1	Anchor Repair Kit (Prealigner)

Assembly 7: Paper Feed Drive



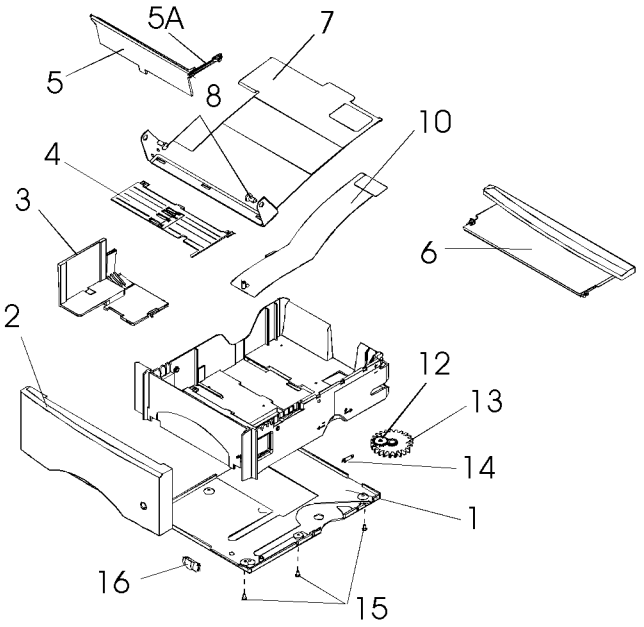
Asm-Index	Part Number	Units	Description
7-1	69G5480	1	D-Roller Asm
-2	1328279	1	Washer, Thrust
-3	1126832	1	Clip, D-Roll
-4	1408703	1	Rail Assembly, Right (W/O gears)
-5	1328313	1	Shield, D-Roll
-6	1381790	1	Shaft, D-Roll (with Gear 11 and D-Roller Asm)
-7		2	Bushing, Parts Packet 1383315 Must be installed properly. Align slot in bushing with notch in frame assembly.
-8		1	Spring, Gear Advance Parts Packet 1383316
-9	1381791	1	Paper Feed Magnet
-10			Gear No. 14, Sheet Feed Parts Packet 1383318
-11		1	Gear No. 9, Parts Packet 1383318
-12		1	Gear No. 7, Parts Packet 1383318
-13		1	Gear No. 8, Parts Packet 1383318
-14		1	Gear No. 10, Parts Packet 1383318
-15		1	Screw, Clutch Mag. Mtg., Parts Packet 1383314
-16		1	Spring, Magnet Arm, Parts Packet 1383316
-17		1	Washer, Parts Packet 1383314
-18		2	Washer, Thrust Parts Packet 1383314
-19		2	Bushing, Gear 10, Parts Packet 1383315
-20		1	Gear 13, Parts Packet 1383318
-21		2	Clip, Parts Packet 1383315
-22	1039170	1	Machine Pad

Assembly 8: Standard Paper Tray (200-sheet)



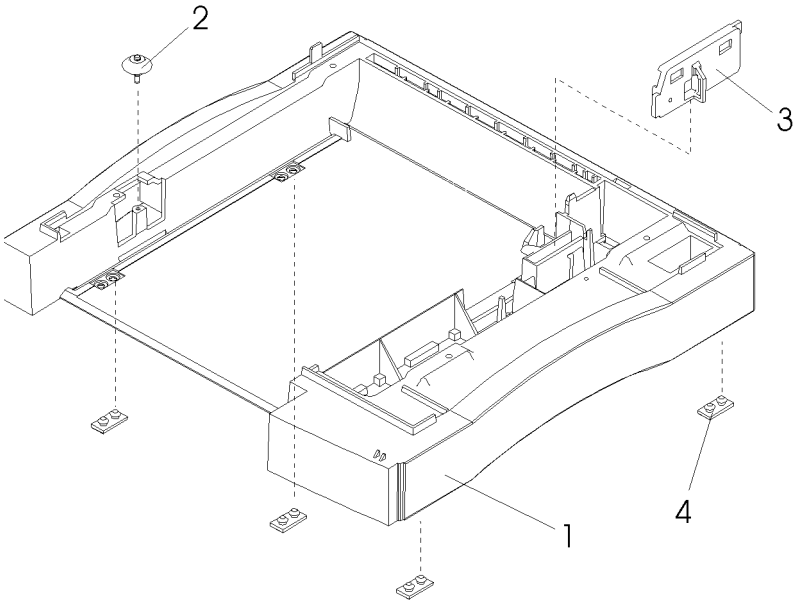
Asm-Index	Part Number	Units	Description
8-	1427375	1	Paper Tray Assembly, 11 in. (200-sheet)
-	1427376	1	Paper Tray Assembly, 14 in. (200-sheet)
-	1427361	1	Paper Tray Assembly for Labels, 11 in. (200-sheet)
-	1427364	1	Paper Tray Assembly for Labels, 14 in. (200-sheet)
-	1427379	1	Paper Tray Assembly, A5
-1	1408170	1	14 in. Cover
-2	1408725	1	Paper Stop
-3	1408567	1	Corner Buckler
-4	1408732	1	Liner, 11 in.
-4	1408733	1	Liner, 14 in.
-5	1408724	1	Adjustable Guide
-6	1058486	1	Universal Paper Tray
-7	1381661	1	Kit, Paper Level Indicator

Assembly 9: Paper Tray (500-Sheet)



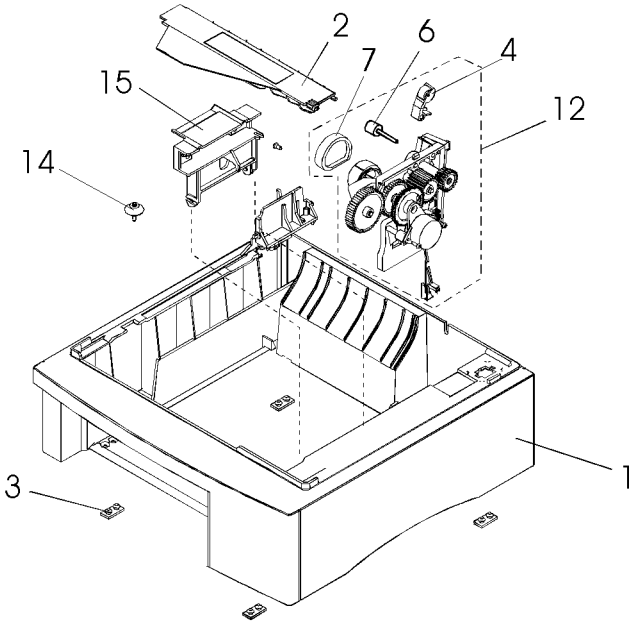
Asm-Index	Part Number	Units	Description
9-	1427377	1	Paper Tray Assembly, 11 in.
-	1427378	1	Paper Tray Assembly, 14 in.
-	1427424	1	Paper Tray Assembly, Light Weight Labels (550g spring), 11 in.
-	1427372	1	Paper Tray Assembly, Light Weight Labels (550g spring), 11 in.
-	1427367	1	Paper Tray Assembly, Heavy Weight Labels (650g spring), 11 in.
-	1427428	1	Paper Tray Assembly, Heavy Weight Labels (650g spring), 14 in.
-1	1408361	1	Bottom Cover 11 in.
-1	1408362	1	Bottom Cover 14 in.
-2	1381660	1	Cover, Front Trim 11”
-2	1408369	1	Cover, Front Trim 14”
-3	1408708	1	Paper Guide
-4	1408387	1	Slide 11 in.
-4	1408388	1	Slide 14 in.
-5	1183262	1	Paper Stop
-5A	1408710	1	Slider, Paper Stop
-6	1408170	1	Cover 14 in.
-7	1195835	1	Pivot Plate, with label
-8		2	Retainer, Parts Packet 1381663
-10	1424558	1	Spring Assembly
-11		1	Setscrew, Parts Packet 1381663
-12	1039594	1	Thumb Wheel Gear
-13	1408707	1	Wheel
-14	1039597	1	Detent Spring
-15		2	Screw, Parts Packet 1381663
-16	1408389	1	Indicator, Paper Level

Assembly 10: Base for Paper Drawer (500-Sheet)



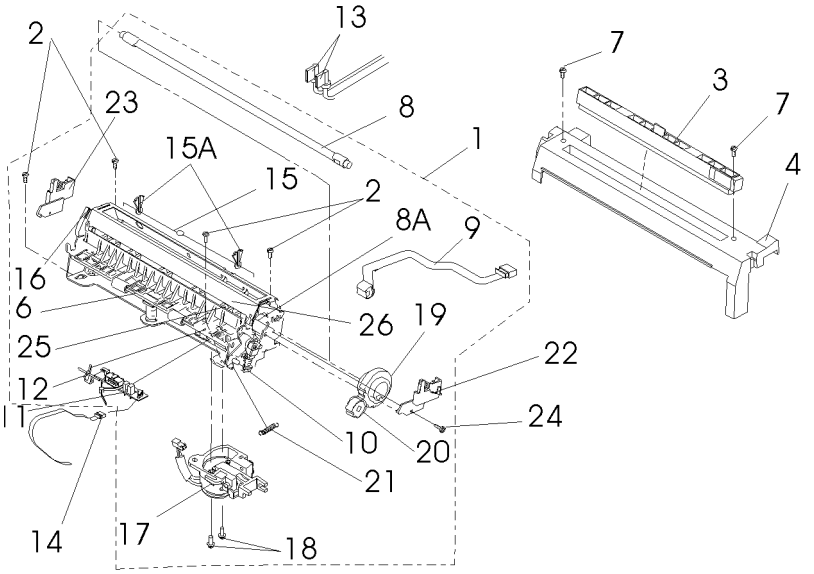
Asm-Index	Part Number	Units	Description
10-1	1408289	1	Housing
-2	1039558	1	Roll
-3	1409146	1	Plate Assembly, Gear
-4	1039170	4	Pad, Machine
NS	1328674	1	Clip, Ground

Assembly 11: Optional Paper Drawer (500-Sheet)



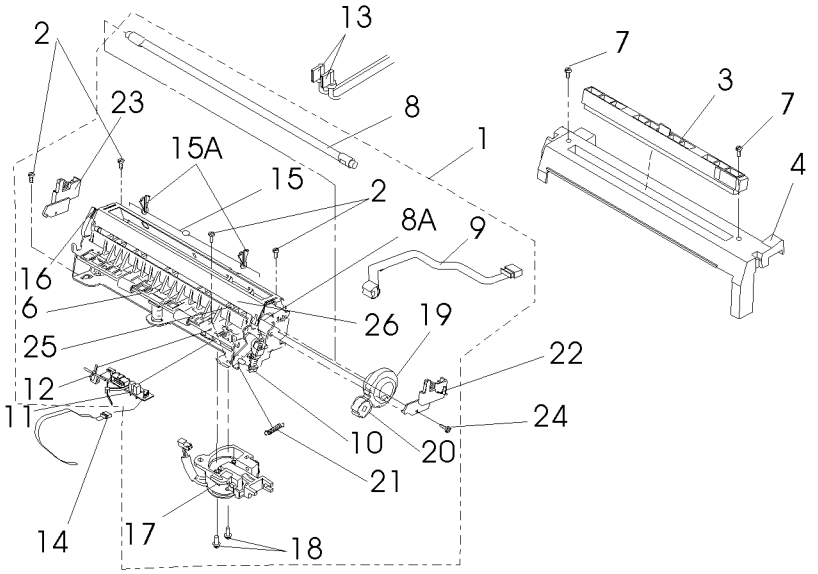
Asm-Index	Part Number	Units	Description
11-1	1408161	1	Base Assembly
-2	1328630	1	Deflector
-3	1039170	1	Feet
-4	1039596	1	Bellcrank Assembly
NS		1	Spring, Bellcrank--Parts Packet 1381666
-6	1039603	1	Drive Roller
-7	1039540	1	D-Roller Tire
-8	1381306	1	Torquer Motor
-11		1	Spring--Parts Packet 1381666
-12	1381638	1	Drive Assembly
-14	1039558	1	Roller
-15	1183299	1	Switch Assembly
-16		1	Screws--Parts Packet 1381663

Assembly 12: Fuser



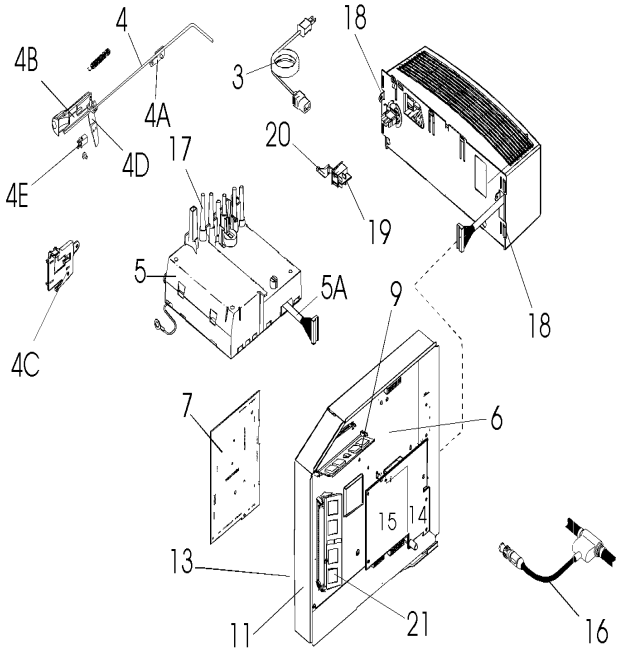
Asm-Index	Part Number	Units	Description
12-1	1381639	1	Fuser and Lamp 110V 3112-001
-1	1381641	1	Fuser and Lamp 220V 3112-001
-1	1381640	1	Fuser and Lamp 110V 3116-001, -002, -003
-1	1381642	1	Fuser and Lamp 220V 3116-001, -002, -003
-2		4	Screw, Fuser Mounting, Parts Packet 1381663
-3	1382287	1	Fuser Wiper Assembly (supply item)
-4	1328132	1	Fuser Cover
-6		1	Spring Redrive Exit, Parts Packet 1381666
-7		2	Screw, Parts Packet 1381663
-8	1381523	1	Fuser Lamp 110V 3112-001. Install lamp with color-coded end away from gear.
-8	1381524	1	Fuser Lamp 220V 3112-001. Install lamp with color-coded end away from gear.
-8	1381011	1	Fuser Lamp 110V 3116-001, -002, -003. Install lamp with color-coded end away from gear.
-8	1381037	1	Fuser Lamp 220V 3116-001, -002, -003. Install lamp with color-coded end away from gear.
-8A	1381146	1	Hot Roll assembly
NS	1329928	1	Backup Roll
-9	1381637	1	Thermistor Sensor Asm
-10	1328458	1	Redrive Idle Arm Asm
-11	1328397	1	Paper Exit Bd Asm
-12		1	Flag, Parts Packet 1381669
-13	1039481	1	Fuser Power Cable
-14	1381662	1	Cable, Fuser/Paper Size Sensor
-15	1381155	1	Thermal Fuse Asm
-15A	1328134	2	Clips, Thermal Fuse
-16	1427304	1	Bail Handle
-17	1381018	1	Fuser Solenoid Asm
-18		2	Screw, Fuser Solenoid Mtg., Parts Packet 1381663
-19	1328124	1	Gear No. 1, Hot Roll
-20		1	Gear 18T Redrive, Parts Packet 1381665
-21		1	Spring, Redrive Idler Parts Packet 1381666
-22	1328437	1	Contact Asm, Right Lamp
-23	1328438	1	Contact Asm, Left Lamp

Assembly 12: Fuser (Continued)



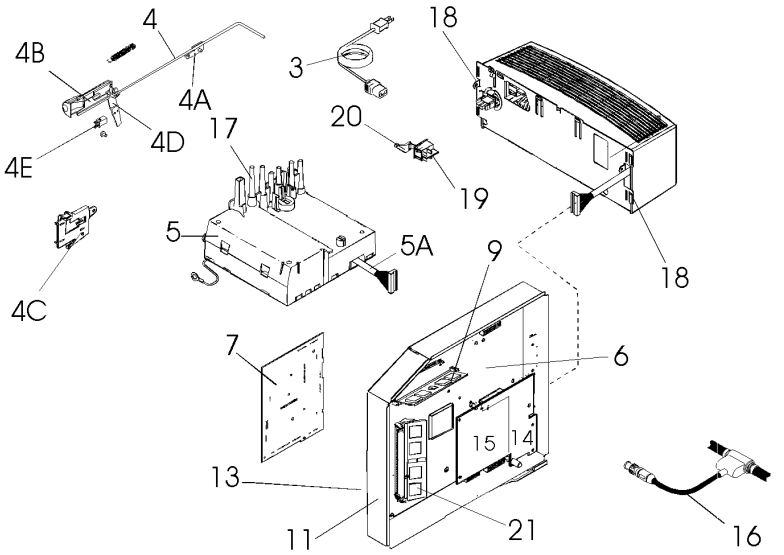
Asm-Index	Part Number	Units	Description
12-24		2	Screw, Mtg., Parts Packet 1381663
-25	1039316	5	Detack Fingers
-26	1039317	5	Detack Finger Springs

Assembly 13: Electronics



Asm-Index	Part Number	Units	Description
13-1	1381643	1	LV Power Supply 110V
-1	1381644	1	LV Power Supply 220V
NS	1328463	1	Fuse, LVPS SB 12A 110V
NS	1328464	1	Fuse, LVPS 6.3A 220V
-3	1342514	1	Power Cord Set, U.S./Canada/Mexico/Central and South America/Saudi Arabia (LV)
-3	1342530	1	Power Cord Set, Germany/France/Spain/ Norway/Finland/the Netherlands/Austria/ Belgium/Brazil/Greece/Luxembourg/Portugal/ Sweden/Turkey/Indonesia/Saudi Arabia (HV)
-3	1342532	1	Power Cord Set, S. Africa
-3	1342533	1	Power Cord Set, Switzerland
-3	1342534	1	Power Cord Set, Chile/Italy
-3	1342535	1	Power Cord Set, Denmark
-3	1342536	1	Power Cord Set, New Zealand/Australia/ Argentina/Paraguay
-3	1342537	1	Power Cord Set, Israel
-3	1342543	1	Power Cord Set, UK/Malaysia/Singapore
-4	1408274	1	Rod, on/off
-4A	1408277	1	Support, Rod on/off
-4B	1408198	1	Actuator, On/Off
-4C	1408275	1	Plate, On/Off Actuator
-4D	1408276	1	Lever, Pivot
-4E	1408272	1	Latch, On/Off
-5	1381645	1	HV Power Supply
-5A	1381653	1	Cable, HVPS
-6	1381713	1	RIP Board, 3112-001
-6	1381711	1	RIP Board, 3116-001, -002, -003
-7	1381694	1	Engine Board, 3112-001
-7	1381695	1	Engine Board, 3116-001, -002, -003
NS	1408063	1	Cable, Erase Lamps/Input Sensor
-9	1321882	1	DRAM SIMM 4 MB
-9	1328589	1	DRAM SIMM 2 MB
-9	1321883	1	DRAM SIMM 8MB
-11	1381651	1	Inner EMC Shield

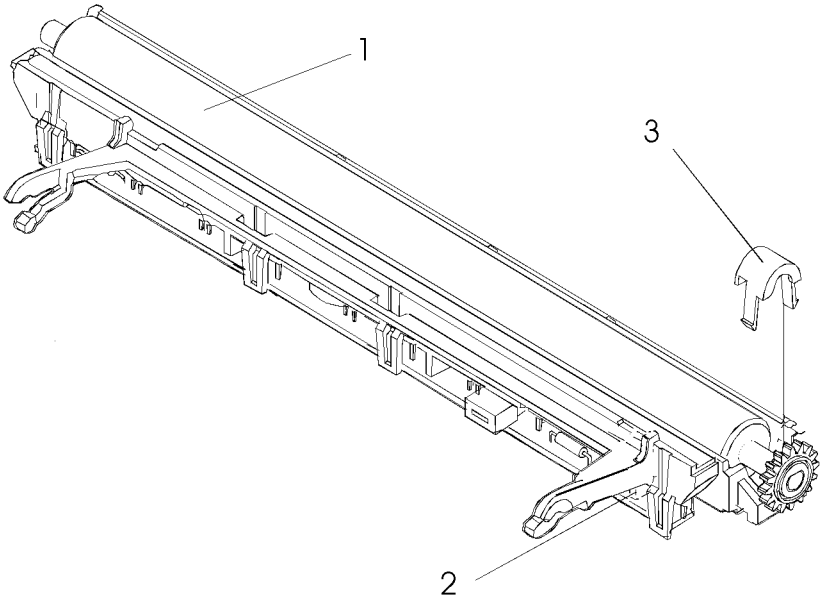
Assembly 13: Electronics (Continued)



Asm-Index	Part Number	Units	Description
NS	1381664	1	Standoff Kit, Board Mounting
13-13	1408106	1	Guide, Font Card
-14	30H3274	1	Host Card (Twinax)
-14	30H3278	1	Host Card (Coax)
-15	30H3719	1	IPDS W/3916 Font Set. See note 1 and 2.
-15	30H3720	1	IPDS Card W/3812 Font Set. See note 1 and 2.
-16	57G2126	1	Twinax T-cable
NS			IPDS memory (See “Options” on page 160)
NS		2	Screw, HVPS Mtg., Parts Packet 1381663
-18		2	Screw, LVPS Mtg., Parts Packet 1381663
-19	1383513	1	Switch On/Off
-20	1039456	1	Switch Pivot
-21	1381714	1	ROM SIMM

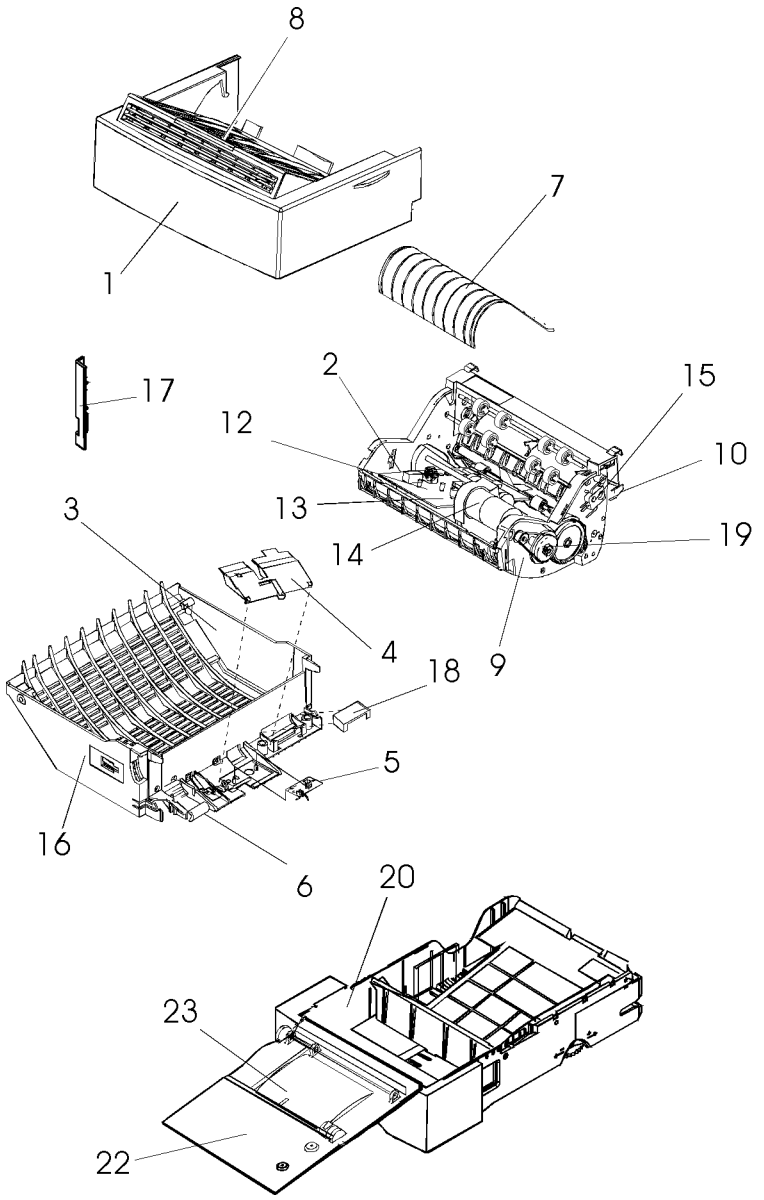
Note 1: If you are unsure of the font set, see PN label on the IPDS card.
Note 2: IPDS Cards as FRUs contain no DRAM SIMM. Be sure to transfer DRAM SIMM from the faulty card to the new card.

Assembly 14: Transfer Roll



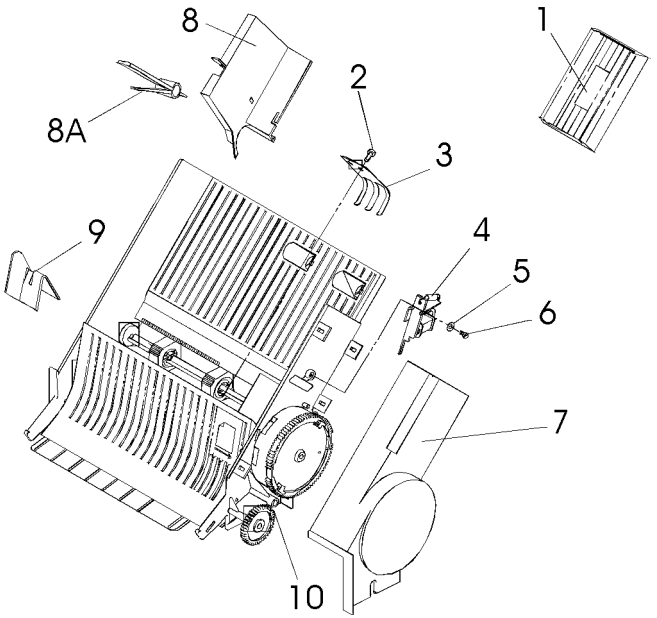
Asm-Index	Part Number	Units	Description
14-1	1381008	1	Roll Asm, Transfer
-2	1381652	1	Housing, Transfer
		1	o Rear Lens Asm, Erase
		1	o Contact, Transfer Roll
		1	o Lamp Asm, Erase
-3	1328356	1	Cover, Clip Bearing

Assembly 15: Duplex Option



Asm-Index	Part Number	Units	Description
15-1	1381551	1	Top Cover Asm
-2	1381552	1	Duplex System Card
-3	1381554	1	Bottom Cover
-4	1408940	1	Exit Sensor Cover
-5	1381555	1	Exit Sensor Asm
-6	1408906	1	Bellcrank
-7	1408905	1	Table Cover (Floor)
-8	1408949	1	Paper Stop/Slide
-9	1381558	1	Gear Block Frame Asm
-10	1381559	1	Input Sensor Card
-12	1326042	1	Cable, Stepper Motor
-13	1408918	1	Cable, Sensor
-14	1381025	1	Paper Feed Motor (DC)
-15	1326113	1	Switch Asm Cover Open
-16	1381570	1	Switch Asm, Front Exit
-17	1408969	1	Cover, Corner Trim
-18	1408942	1	Cover, Auto-connect Plug
-19	1326064	1	Belt, Paper Drive
-20	1408889	1	Tray Asm, 300 w/Top Cover L/Lx
-20	1408884	1	Tray Asm, 130 w/Top Cover R/Rx
-22	1381560	1	Top Cover, Paper Tray
-23	1038708	1	Belt, Paper Tray
NS	1381561	1	Gear Parts Pack
NS	1381048	1	Flag Parts Pack

Assembly 16: Envelope+ and 100-Sheet Auxiliary Feeder



Asm-Index	Part Number	Units	Description
16-	1408893	1	Envelope+ Feeder
-	1408894	1	100-Sheet Auxiliary Feeder
-1	1408862	1	Weight Assembly
-2	1622529	1	Screw
-3	1039615	1	Spring
-4	1383944	1	Magnet Assembly
-5	1622303	1	Washer
-6	1622536	1	Screw, Mtg
-7	1408869	1	Cover, Right
-8	1408868	1	Guide, Large
-8A	1408861	1	Latch, Guide
-9	1408863	1	Guide, Small
-10	1183273	1	Spring, Override Lever (100-Sheet Auxiliary Feeder Only)
NS	1383934	1	Roller Pack (Envelope+ Feeder Only)
NS	1383935	1	Roller Pack (100-Sheet Auxiliary Feeder Only)

Options

Asm-Index	Part Number	Units	Description
NA	1328585	1	2MB Flash SIMM
	1376461	1	4MB Flash SIMM
	1328589	1	2MB DRAM SIMM (printer memory)
	1321882	1	4MB DRAM SIMM
	1321883	1	8MB DRAM SIMM
	1427322	1	16MB DRAM SIMM
	1427323	1	32MB DRAM SIMM
		1	Option Cards
	1381050	1	o INA-LocalTalk
	1402219	1	o INA-Ethernet 10Base2, high memory
	1402217	1	o INA-Token Ring, high memory
	1402218	1	o INA-Ethernet 10BaseT, high memory
	1328563	1	o Thumbscrew, INA
	1325231	1	Font Card Adapter
	1425267	1	Hard Disk, 40MB
	1321882	1	4MB IPDS memory
	1321883	1	8MB IPDS memory

Miscellaneous

Asm-Index	Part Number	Units	Description
NA	1319128	1	Parallel Wrap Plug
	1329048	1	Serial Wrap Plug
	1381663	1	Fasteners parts packet
	1381666	1	Springs parts packet
	1381665	1	Gears (7-14) parts packet
	1381145	1	Metering and Prealigner rolls parts packet
	1329301	1	Grease, 2g
	1384076	1	Grease, conductive 1 oz.
	1383586	1	Grease, damping, 1 oz.
	9900692	1	Grease, IBM #23
	1280443	1	Oil, IBM #10 4 oz.
	1381035	1	Duplex Gears parts packet
	1381048	1	Duplex Flags parts packet
	1381669	1	Jumpers/Flags parts packet
	1381664	1	Standoffs parts packet
	1381661	1	Indicator parts packet, 200 sheet tray

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SA40-0843-00
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